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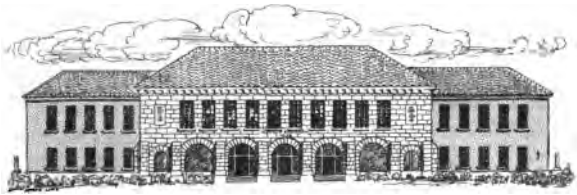

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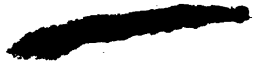

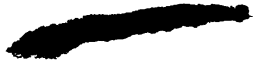

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83 Beekman St., N. Y.

PREFACE.

CHILDREN obtain their first idea of numbers from the objects around them. In accordance with this law of development and growth of the young mind, the "object" method is freely used in the following pages.

1. The first ten numbers and their simple combinations are illustrated by pictures of visible objects.

2. The pupil from the first is taught to make figures, and to illustrate small numbers by unit marks.

3. As soon as a fact or principle is learned, he is taught its application and begins to practice it.

4. Oral and Slate Exercises are combined throughout the book.

5. Addition and Subtraction are taught in connection; being converse, the one is suggested by the other. For the same reason, Multiplication and Division are presented together. This is believed to be the best and most approved method of teaching these subjects.

6. The work is divided into Six Sections, and each Section into Twenty Lessons. The respective sections cover the ground required for promotion to corresponding Grades in the Primary Schools of New York, Brooklyn, and other large cities.

These and other features of the book, it is hoped, will aid teachers in their work, and facilitate the progress of pupils in gaining a practical knowledge of this important study.

J. B. T.

BROOKLYN, *May*, 1882.

SUGGESTIONS.

1. The requisites for success in teaching are a *knowledge* of the subject, a *love* for the employment, and an *aptitude* to teach.

2. Beginners should be furnished with suitable tools, as slates, blackboards, numeral-frames, counters, etc.

3. Special pains should be taken to lead them to form the *habit* of *observation*.

4. Do not attempt to teach *too many things* at one recitation.

5. The language used in explanations should be *simple* and in *point*, giving just help enough to enable the learner to do the thing himself. More than this is not only *useless* but *hurtful*.

6. The simple Tables should be carefully illustrated, and then *thoroughly committed to memory*.

7. It is of the first importance to *secure* the *attention* of the Class during Recitation. To do this, two things are necessary; 1st. The exercise must be conducted with *animation;* 2d. Every pupil must be *kept busy*.

8. Avoid superficial habits. *Accuracy* first, then *rapidity*.

9. Make the mind of each pupil a careful study, and having found what he *knows*, lead him to discover that which he does *not* know.

10. *Carelessness* in making figures, or in the arrangement of written exercises on the slate, should *never* be allowed.

11. Every recitation should be supplemented by *dictation* exercises.

12. Thoroughness should be the motto of every teacher.

First Lessons.

Counting.

LESSON I.

1. What do you see in this picture?
2. What has the milk-maid in her hand?
3. What is a single thing called?
4. Point to one chair. One door. One book.
5. Name other single things, or ones.
6. How many cows in the picture? How many pails?
7. Spell *one*. Write it on your slate.
8. How many heads have you?
9. Hold up one hand. Hold up one finger. One thumb.
10. What is the figure in the middle of the picture called?
11. Write the *figure one* on your slate; thus, *1*.

LESSON II.

1. What do you see in this picture?
2. How many are one boy and one boy?
3. How many hands have you? How many feet?
4. How many boys are in the picture?
5. If one falls, how many will be standing?
6. Make one mark upon your slate. Make another. //
7. How many are one mark and one mark?
8. Rub out one of the marks, how many are left?
9. One apple from two apples leaves how many?
10. How many are one dog and one dog?
11. If you have two cents and spend one, how many will be left?
12. Spell *two*. Write it on your slate twice.
13. Hold up two fingers. Two thumbs.
14. If you shut one thumb how many will be open?
15. How many ones make two?
16. Two are how many more than one?
17. How many letters in the word ax? In ox?
18. How many are 2 pears less 1 pear?
19. What figure is in the middle of the picture?
20. Write the *figure two* on your slate; thus, **2.**

LESSON III.

1. What is in this picture?
2. How many are two men and one man?
3. How many are one horse and two horses?
4. Point to two books and one book.
5. Show two fingers and one finger.
6. How many letters in the word man? In boy?
7. Clap your hands three times.
8. Take two steps forward. Take one more.
9. How many forward steps have you taken?
10. Count three in concert, beating time.
11. Count from three back to one.
12. Three pears less one pear, are how many?
13. If you have 1 plum and Jane gives you 2 more, how many will you then have?
14. If you have three cents and lose one, how many will you have left?
15. Spell *three*. Write it on your slate.
16. What figure is in the middle of the picture?
17. Write the *figure three* on your slate; thus, 3.
18. How many are 1 and 1? 2 less 1? 2 less 2? 1 and 2? 2 and 1? 3 less 1? 3 less 2? 3 less 3?

LESSON IV.

1. What is in this picture?
2. How many kittens? How many cats?
3. How many are three and one?
4. How many rats are near the basket?
5. How many are coming out of a hole?
6. How many are one rat and three rats?
7. Make three marks on your slate. Make one more. ///, /
8. Count the marks? Rub out one, how many are left?
9. Count four in concert, beating time.
10. Count from four back to one.
11. How many fingers on your right hand?
12. Shut 2, how many are open? Shut 3, how many?
13. Make 2 marks. On the right make 2 more. //, //
14. How many 2's make four?
15. Charles had four oranges and gave 2 to Henry; how many were left?
16. Spell "four." Write the word *four* on your slates? How many letters has it? How many letters in the word book?
17. Write the *figure four* neatly on your slate; thus, *4*.
18. How many are 3 and 1? 1 and 3? 2 and 2?
19. How many are 4 less 1? 4 less 3? 4 less 2?

LESSON V.

1. How many girls are feeding the swans?
2. How many other girls in the picture?
3. How many are 4 girls and 1 girl?
4. How many swans are coming to get the food?
5. How many more swans do you see on the pond?
6. How many are 2 swans and 3 swans?
7. Make five short marks on your slate; thus, /////
8. Crossing out one leaves how many?
9. Crossing out another leaves how many? Another?
10. How many have you crossed out?
11. How many are left?
12. Count five in concert, beating time.
13. Count from five back to one.
14. Spell "five." Write the word five.
15. Write the *figure five* as in the picture; thus, *5*.
16. One mark and one mark are how many?
17. Two marks and one mark are how many?
18. Uniting two numbers in one is **Adding**.
19. Taking one number from another is **Subtracting**.
20. How many are 4 and 1? 1 and 4? 5 less 1? 5 less 4? 3 and 2? 2 and 3? 5 less 2? 5 less 3? 5 less 5?

LESSON VI.

1. Make 5 marks on your slate. At the right make another. How many are 5 marks and 1 mark?

2. How many men are mowing? How many raking?

3. Count six in concert, by ones.

4. Count from six back to one.

5. Count the men raking, by twos.

6. Rap on your slate six times with your pencil.

7. Count the men mowing, by threes.

8. Spell "six." Write the word on your slate.

9. How many are three 2's? //, //, //

10. How many are two 3's? ///, ///

11. Show six fingers. Take away 2; how many are left?

12. Nellie had six pinks and gave 3 to her teacher; how many had she left?

13. George paid 2 cents for a peach, 2 cents for a pear, and 2 cents for a banana; how many cents did he pay for all?

14. What figure is in this picture?

15. Write the *figure six* on your slate; thus, *6.*

16. How many are 5 and 1? 4 and 2? 3 and 3? 2 and 4?

17. How many are 6 less 1? 6 less 2? 6 less 3? 6 less 4?

LESSON VII.

1. How many large yachts in the picture? How many smaller ones? How many are 6 yachts and 1 yacht?
2. How many boats are on the water? On the land?
3. How many are 4 boats and 3 boats?
4. Count seven in concert, beating time.
5. Count from seven back to one.
6. Count the yachts in the picture.
7. If 1 sails away, how many will be left?
8. Make seven marks. Rub out 2, how many are left?
9. Henry has 4 pencils; how many more make seven?
10. How many are 4 apples and 3 apples? Show this by your fingers? How many are 3 and 4?
11. Spell "seven." Write the word seven on your slate.
12. Write six marks in 3's. /// ///
13. How many more marks will make seven?
14. Seven peaches are in a fruit dish. Take out 2, how many are left? Take 3, how many? Take 4? Take 5?
15. What figure is in the picture?
16. Write the *figure seven* neatly; thus, *7.*
17. How many are 6 and 1? 7 less 1? 5 and 2? 7 less 5? 4 and 3? 7 less 4? 3 and 4? 7 less 3? 2 and 5?

LESSON VIII.

1. One duck is just rising from the water; count the others that are flying.
2. How many are seven ducks and one duck?
3. How many ducks are swimming in the nearest group?
4. How many in the other? How many are 5 and 3?
5. If 2 of these are shot, how many will be left?
6. Eight are how many more than 5? Than 4?
7. Count eight in concert, beating time.
8. Count back to one.
9. Make eight marks in pairs. //, //, //, //
10. Write eight marks in groups of four. ////, ////
11. How many 2's make 8? How many 4's?
12. Count eight by 2's. By 4's. Count back by 2's.
13. Three books taken from eight books leave how many?
14. How many pairs of ducks are flying?
15. How many are 3 cents, 4 cents, and 1 cent?
16. What figure is seen in the picture?
17. Write the *figure eight* neatly on your slate. *8.*
18. How many are 7 and 1? 1 and 7? 8 less 1? 8 less 7? 6 and 2? 2 and 6? 8 less 2? 8 less 6? 5 and 3? 3 and 5? 8 less 3? 8 less 5? 4 and 4? 8 less 4?

LESSON IX.

1. What is seen in this picture?

2. If one butterfly lights on a flower, how many will be left flying? How many are 8 and 1?

3. How many flowers in the picture? Butterflies?

4. How many roses in the picture? How many daisies?

5. How many are 5 things and 4 things?

6. If a butterfly lights on each rose, how many will be left flying?

7. If you pick 3 daisies, how many flowers will be left?

8. Count nine in concert, beating time.

9. Count back to one.

10. Make nine marks in groups of 3. ///, ///, ///

11. Count nine by 3's. Count back to 1 by 3's.

12. How many taken from nine peaches leave 6?

13. Waldo has 5 figs, Harry 4; how many have both?

14. If they eat 2 apiece, how many will each have?

15. What figure is in the picture?

16. Write the *figure nine* with care on your slate. *9.*

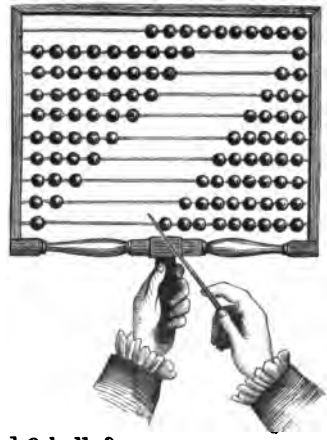
17. How many are 1 and 8? 8 and 1? 9 less 1? 9 less 8? 7 and 2? 2 and 7? 9 less 2? 9 less 7? 6 and 3? 3 and 6? 9 less 3? 9 less 6? 5 and 4? 9 less 4?

LESSON X.

1. Make nine marks on your slate? ////////, /
2. Make one more at the right.
3. How many are 9 marks and 1 mark?
4. How many boys in the picture are in the front row?
5. How many in the second row?
6. How many are 2 boys and 4 boys?
7. How many are 6 boys and 4 boys?
8. Count ten in concert. Count back to one.
9. Count the girls in the picture. The boys.
10. Howard had ten credit marks and lost 4; how many had he left? If he gains 5 more, how many will he have?
11. John had ten cherries and gave 5 to his sister; how many had he left? Ten less 5 are how many?
12. What number do the figures in the picture express?
13. Write ten in figures; thus, *10.*
14. What does the right-hand figure denote and what called? *Ans.* It is called **Naught, Zero,** or **Cipher,** and standing alone denotes **Nothing.**
15. Write in figures the first ten numbers; thus,

1, 2, 3, 4, 5, 6, 7, 8, 9, 0.

LESSON XI.



1. Here is a **Numeral Frame.**

2. Count the balls on the upper wire, in concert, as I point to them.

3. How many are 10 balls and 1 ball? *Ans.* **Eleven.**

4. How many are eleven balls and one ball? **Twelve.**

5. How many are 10 balls and 2 balls?

6. How many are twelve balls and one ball? **Thirteen.**

7. How many are 10 balls and 3 balls?

8. How many are thirteen balls and one ball? **Fourteen.**

9. How many are 10 balls and 4 balls?

10. How many are fourteen balls and 1 ball? **Fifteen.**

11. How many are 10 and 5?

12. How many are fifteen and one? **Sixteen.**

13. How many are 10 and 6?

14. How many are sixteen and one? **Seventeen.**

15. How many are 10 and 7?

16. How many are seventeen and one? **Eighteen.**

17. How many are 10 and 8?

18. How many are eighteen and one? **Nineteen.**

19. How many are 10 and 9?

20. How many are nineteen and one? **Twenty.**

21. How many are 10 and 10?

22. Count from ten to twenty in concert.

LESSON XII.

1. What is the greatest number expressed by 1 figure?

2. When two figures are written side by side, what does the right-hand figure always denote? *Ans.* **Units** or **Ones.**

3. What the figure in the second place? *Ans.* **Tens.**

4. Write ten in figures; thus, *10.*

5. What does the naught or cipher denote?

Ans. That there are *no units* or *ones.*

6. What does the 1 denote? *Ans.* **1 ten.**

7. How are the numbers from ten to twenty formed?

Ans. By adding the first nine numbers to ten.

Eleven (one ten and one)	is written	*11.*
Twelve (one ten and two ones)	"	*12.*
Thirteen (one ten and three ones)	"	*13.*
Fourteen (one ten and four ones)	"	*14.*
Fifteen (one ten and five ones)	"	*15.*
Sixteen (one ten and six ones)	"	*16.*
Seventeen (one ten and seven ones)	"	*17.*
Eighteen (one ten and eight ones)	"	*18.*
Nineteen (one ten and nine ones)	"	*19.*

8. Ten and how many ones make fifteen?

9. What does the word thirteen mean?

Ans. Three and ten.

10. What does sixteen mean? Fifteen? Seventeen? Fourteen? Eighteen? Nineteen?

11. Write twenty in figures; thus, *20.*

12. What do these figures denote?

Ans. Two *tens* and no *units* or *ones.*

13. Write in figures thirteen; seventeen; twelve; eighteen; fourteen; nineteen; fifteen; sixteen; twenty.

LESSON XIII.

1. Write twenty in figures. *20*
2. What does each of these figures denote?
3. Write the figures 2 and 1 side by side.
4. What do these figures denote?

Ans. Two *tens* and one *unit*, or **Twenty-one.** *21*

5. Write the figures denoting **Twenty-two.** *22*
6. " " " **Twenty-three.** *23*
7. " " " **Twenty-four.** *24*
8. " " " **Twenty-five.** *25*
9. " " " **Twenty-six.** *26*
10. " " " **Twenty-seven.** *27*
11. " " " **Twenty-eight.** *28*
12. " " " **Twenty-nine.** *29*
13. " " " **Thirty.** *30*
14. Count from twenty to thirty in concert.
15. Count from thirty back to twenty.
16. Twenty and how many make twenty-four.
17. How many tens make twenty?
18. How many tens make thirty?
19. Twenty-three is how many more than twenty?
20. Twenty and what number make twenty-eight?
21. Twenty-five is how many more than twenty?
22. Twenty is how many less than twenty-two?
23. Twenty and what number make twenty-nine?
24. Twenty is how many less than twenty-five?
25. Thirty is how many more than twenty?
26. Copy and read the following numbers:

23; 27; 25; 28; 24; 17; 14; 26; 22; 9; 17; 19; 29; 30.

LESSON XIV.

1. When two figures are written side by side, what does each denote?

2. What number do 3 tens and 1 unit denote?

3. Write thirty-one in figures: thus, *31*

4. What number do 3 tens and 2 units denote?

5. Thirty and how many ones make thirty-four?

6. Thirty is how many less than thirty-five?

7. Thirty and how many ones make thirty-seven?

8. Thirty is how many less than thirty-six?

9. Thirty-nine and how many ones make forty?

10. Write the numbers from thirty to forty in figures.

11. How many are 3 tens and 1 ten?

12. Write in figures 4 tens, or forty; thus, *40*

13. Count from thirty to forty in concert.

14. Count back from forty to thirty.

15. What number do 4 tens and 1 unit denote?

16. Write forty-one in figures; thus, *41*

17. How many tens and ones in forty-two?

18. How many tens and ones in forty-four?

19. How many in forty-eight? In forty-six?

20. What do 4 tens and 9 units denote?

21. Forty-nine and how many ones make fifty?

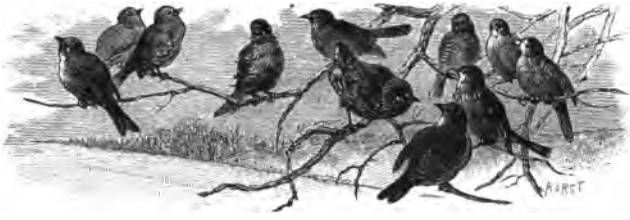
22. Write the numbers from forty to fifty in figures.

23. How many tens are 4 tens and 1 ten?

24. Write 5 tens, or fifty, in figures; thus, *50*

25. Write in figures: thirty-four; forty-three; forty-eight; thirty-seven; forty-six; forty-nine.

26. Copy and read: 27; 29; 43; 38; 45; 39; 28; 35; 49; 37; 48; 36; 50.



LESSON XV.

1. Count the birds in the picture.
2. How many are 6 birds and 3 birds and 2 birds?
3. A flock of blackbirds alighting in a wheat-field, 50 of them were caught in a net; those in the picture flew away; how many were in the flock?
4. How many are 5 tens and 1 unit?
5. Write fifty-one in figures; thus, *51*
6. Write fifty-three in figures. Fifty-six.
7. Write fifty-nine in figures.
8. How many are fifty-nine and one?
9. Write sixty in figures; thus, *60*
10. Count fifty by twos.
11. How many tens and ones in sixty-six?
12. How many are sixty-nine and one?
13. Write seventy in figures; thus, *70*
14. How many tens in seventy?
15. Count from sixty to seventy in concert.
16. Count back to sixty. Count back by twos.
17. Sixty and what number make seventy?
18. Sixty is how many less than seventy?
19. Write the following in figures: fifty-four; sixty-three; forty-eight; thirty-nine; sixty-four; sixty-six.

LESSON XVI.

1. How many are 7 tens and 1 ten?

Ans. Eight tens, or **Eighty.**

2. Count from seventy to eighty.

3. Count back to seventy.

4. Write eighty in figures; thus, *80*

5. How many tens and ones make eighty-three?

6. How many tens and ones make eighty-seven?

7. Eight tens and how many ones make ninety?

8. How many tens make ninety?

9. Write ninety in figures; thus, *90*

10. Write the numbers from eighty to ninety in figures.

11. What figures stand for ninety-one?

12. What figures stand for ninety-three?

13. Nine tens and how many ones make ninety-seven?

14. How many are 9 tens and 1 ten?

Ans. 9 tens and 1 ten are 10 tens, or **One Hundred.**

15. Write one hundred in figures; thus, *100*

16. What is the largest number expressed by two figures?

17. When three figures are written side by side, what is the first figure on the right called? *Ans.* **Units or Ones.**

18. What is the second figure called? *Ans.* **Tens.**

19. What is the third figure called? *Ans.* **Hundreds.**

Recite the following Table of Roman Numerals:

I, One.	VI, Six.	XI, Eleven.	XVI, Sixteen.
II, Two.	VII, Seven.	XII, Twelve.	XVII, Seventeen.
III, Three.	VIII, Eight.	XIII, Thirteen.	XVIII, Eighteen.
IV, Four.	IX, Nine.	XIV, Fourteen.	XIX, Nineteen.
V, Five.	X, Ten.	XV, Fifteen.	XX, Twenty.

LESSON XVII.

1. When 3 figures are written side by side, what does each denote?

2. Write one hundred in figures.

3. Write one hundred and one unit. *101*

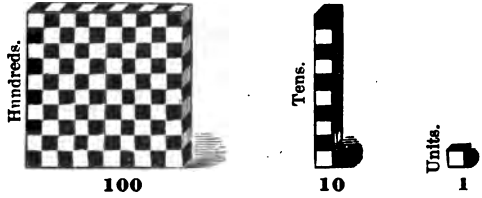
4. Write one hundred and one ten. *110*

5. Write one hundred, one ten and one unit. *111*

6. How many units or ones make a ten? *Ans.* **Ten.**

7. How many tens make a hundred? *Ans.* **Ten.**

8. How many ones make a hundred?



9. How many blocks on the right of the picture?

10. How many in the middle?

11. How many on the left?

NOTE.—The above diagram illustrates the regular increase in the value of units from right to left; a unit in each place towards the left being ten times greater than the one before it on the right.

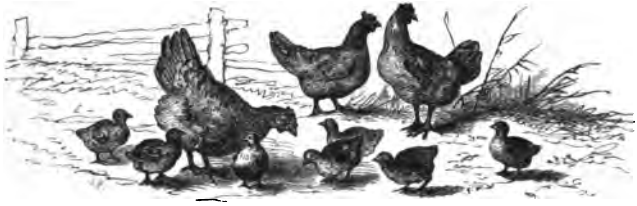
12. When the figure 1 is in the second place, how much greater is its value than in the first or right-hand place?

13. When it is in the third place, how much greater is it than in the second place? Than in the first place?

14. Write in figures: one hundred two; one hundred four; one hundred nine; one hundred seven.

LESSON XVIII.

1. How many are 7 boys and 6 boys?
2. Six and what number make 13?
3. Thirteen less 7 are how many? Less 6?
4. Twelve and what number make 15?
5. Fifteen less 3 are how many? Less 5?
6. Sixteen less 3 are how many? Less 6?
7. Seventeen is how many tens and ones?
8. Forty-five is how many tens and ones?
9. Fifty-two is how many tens and ones?
10. Sixty-eight is how many tens and ones?
11. Seventy is how many tens and ones?
12. Eighty-six is how many tens and ones?
13. Write in figures: eighteen; twenty-six; thirty-two.
14. Write fifty-four; sixty-nine; seventy-five; ninety; eighty-three.
15. Beginning with 1, count by twos to 30; as three, five, seven, nine, eleven, etc.
16. Beginning with 1, count by threes to 31.
17. Beginning with 1, count by fours to 41.
18. Beginning with 1, count by fives to 51.
19. Copy and read: 57; 59; 65; 67; 68; 72; 75; 93; 84; 96; 99; 100; 105; 107; 109.



LESSON XIX.

1. How many chickens in the picture? How many hens? How many are 7 ones and 3 ones?

2. What is finding how many ones are in two or more numbers called?

Ans. **Adding**, or **Addition.**

3. What is the number found by addition called?

Ans. The **Sum**, or **Amount.**

4. Make the Sign denoting Addition; thus, +

5. What is this sign called, and what does it mean?

Ans. It is called **Plus**, and means "and" or "added to."

6. If you have 7 chickens and 3 of them are stolen by rats; how many will you have left?

7. What is taking away a part of a number called?

Ans. **Subtracting**, or **Subtraction.**

8. What is the part left called?

Ans. The **Difference**, or **Remainder.**

9. Make the Sign of Subtraction; thus, −

10. What is this sign called, and what does it mean?

Ans. It is called **Minus**, and means "*less.*"

11. When placed between two numbers what does it show?

Ans. It shows that the number after it is to be taken from the one before it, and is read "*less*" or minus.

LESSON XX.

1. The **Sign of Equality** is =, and means "are" or "equal."

Thus, 2 pencils + 3 pencils = 5 pencils, is read "2 pencils and 3 pencils are 5 pencils," or "2 pencils plus 3 pencils equal 5 pencils."

Also, 7 − 3 = 4, is read "7 less 3, or 7 minus 3 equal 4."

2. Write the sign of addition on your slate.

3. Write the sign of subtraction. The sign of equality.

4. Copy and read the following:

15 + 13 = 18; 7 + 5 = 12; 16 + 14 = 30.

16 − 3 = 13; 22 − 6 = 16; 30 − 20 = 10.

5. 12 oranges + 3 oranges + 5 oranges = how many?

6. 10 marbles + 8 marbles − 5 marbles = how many?

7. What does the sign (=?) denote?

Ans. It asks the question, "how many."

8. Copy and read the following: 25 + 38 − 41 = ? 46 − 38 + 95 = ? 102 + 125 − 63 = ?

9. Robert had 11 chestnuts; he gave 6 to his brother; how many had he left? 6 + 5 = ?

10. James has 25 cents and earns 10 more; how many cents has he? 25 + 10 = ?

11. Julia had 10 pin-wheels and Clara 5; they sold 8 to their playmates; how many had they left? 15 − 8 = ?

12. Count 30 by 2's and back.

13. Count 30 by 3's and back.

14. Count 50 by 5's and back.

15. Count 100 by 10's and back.

16. Copy and read the following: 12 + 24 − 8 = ? 24 − 6 + 13 = ? 20 − 12 = ? 16 + 27 − 9 = ? 35 − 12 + 8 = ?

(For Examination and Review Questions, see p. 133, App.)

SECTION II.

TABLES.*

LESSON I.

Copy and recite the following tables:

ADDITION.						SUBTRACTION.					
1	and	0	are	1		1	less	1	leaves	0
1	and	1	are	2		2	less	1	leaves	1
2	and	1	are	3		3	less	1	leaves	2
3	and	1	are	4		4	less	1	leaves	3
4	and	1	are	5		5	less	1	leaves	4
5	and	1	are	6		6	less	1	leaves	5
6	and	1	are	7		7	less	1	leaves	6
7	and	1	are	8		8	less	1	leaves	7
8	and	1	are	9		9	less	1	leaves	8
9	and	1	are	10		10	less	1	leaves	9

Copy and complete the following:

1.	2.	3.	4.
4+1 = ?	3+1 = ?	7−1 = ?	7+0 = ?
6−1 = ?	4−0 = ?	8+1 = ?	1+9 = ?
5+1 = ?	7+1 = ?	6+1 = ?	5−1 = ?
4−1 = ?	5+0 = ?	8−1 = ?	9+1 = ?
1+0 = ?	8−0 = ?	9+0 = ?	1+3 = ?

* To Teachers.—The Addition and Subtraction Tables are placed side by side for the reason that one is the opposite of the other, and is naturally suggested by it.

LESSON II.

Copy and recite the following tables:

1	and	2	are	3		2	less	2	leaves 0
2	and	2	are	4		3	less	2	leaves 1
3	and	2	are	5		4	less	2	leaves 2
4	and	2	are	6		5	less	2	leaves 3
5	and	2	are	7		6	less	2	leaves 4
6	and	2	are	8		7	less	2	leaves 5
7	and	2	are	9		8	less	2	leaves 6
8	and	2	are	10		9	less	2	leaves 7
9	and	2	are	11		10	less	2	leaves 8
10	and	2	are	12		11	less	2	leaves 9

To TEACHERS.—Pupils should be taught to illustrate the tables for themselves. Thus, to show that 3 and 2 are 5, let them hold up 3 fingers and 2 fingers, or make 3 marks and 2 marks upon the slate.

1. Dick has 5 young canary birds and 2 old ones; how many birds has he?

2. Lillie has 7 books and Edith 2; how many have both?

3. How many more books has Lillie than Edith?

4. A house has 7 maple trees, 1 elm, and 2 catalpa trees; how many shade trees has it?

5. Theodore bought a kite for 6 cents, a line for 2 cents, and an apple for 1 cent; how much did he pay for all?

6. Copy and complete the following:

7.	8.	9.	10.
$4+2=?$	$6+2=?$	$8+2=?$	$9-2=?$
$5-2=?$	$1+8=?$	$7-1=?$	$2+7=?$
$2+5=?$	$7-2=?$	$2+9=?$	$8-2=?$
$6-2=?$	$8-1=?$	$10-2=?$	$1+9=?$

LESSON III.

Copy and recite the following tables:

1	and	3	are	4		3	less	3	leaves 0
2	and	3	are	5		4	less	3	leaves 1
3	and	3	are	6		5	less	3	leaves 2
4	and	3	are	7		6	less	3	leaves 3
5	and	3	are	8		7	less	3	leaves 4
6	and	3	are	9		8	less	3	leaves 5
7	and	3	are	10		9	less	3	leaves 6
8	and	3	are	11		10	less	3	leaves 7
9	and	3	are	12		11	less	3	leaves 8
10	and	3	are	13		12	less	3	leaves 9

1. Charles picked 5 apples from one tree, 3 from another; how many apples had he?

2. If he gives away 3 apples, how many will be left?

3. If you read 10 pages in the morning and 3 in the afternoon, how many pages will you read in a day?

4. How many more pages do you read in the morning than in the afternoon?

5. Ten and what number make 13?

6. If you have 9 chickens and a rat kills 3 of them, how many chickens will you have left?

Copy and complete the following:

7.	**8.**	**9.**	**10.**
$5+2=?$	$6+3=?$	$8+2=?$	$9+3=?$
$4-3=?$	$3-2=?$	$8-3=?$	$9-3=?$
$8+2=?$	$7+3=?$	$10-3=?$	$11-3=?$
$7-2=?$	$3+8=?$	$3+6=?$	$3+10=?$

LESSON IV.

Copy and recite the following tables:

1	and	4	are	5		4	less	4	leaves 0
2	and	4	are	6		5	less	4	leaves 1
3	and	4	are	7		6	less	4	leaves 2
4	and	4	are	8		7	less	4	leaves 3
5	and	4	are	9		8	less	4	leaves 4
6	and	4	are	10		9	less	4	leaves 5
7	and	4	are	11		10	less	4	leaves 6
8	and	4	are	12		11	less	4	leaves 7
9	and	4	are	13		12	less	4	leaves 8
10	and	4	are	14		13	less	4	leaves 9

1. Charles had 9 chestnuts and gave away 4; how many had he left? $9+4=?$

2. How many are 5 apples and 4 apples?

3. John had 6 pears and gave away 4; how many had he left? $6+4=?$

4. Four and what number make 7?

5. A man paid $7 for a vest and $4 for a hat; what did he pay for both? 4 from 11 leaves how many?

6. In a garden were 11 melons, and a thief stole 4 of them; how many were left?

Copy and complete the following:

7.	8.	9.	10.
$6+3=?$	$5+3=?$	$8+2=?$	$9+4=?$
$7-2=?$	$8-4=?$	$2+9=?$	$11-2=?$
$8+3=?$	$9+3=?$	$9-3=?$	$12-4=?$
$9-2=?$	$11-3=?$	$10+4=?$	$4+10=?$

LESSON V.

Copy and recite the following tables :

1	and	5	are	6		5	less	5	leaves 0
2	and	5	are	7		6	less	5	leaves 1
3	and	5	are	8		7	less	5	leaves 2
4	and	5	are	9		8	less	5	leaves 3
5	and	5	are	10		9	less	5	leaves 4
6	and	5	are	11		10	less	5	leaves 5
7	and	5	are	12		11	less	5	leaves 6
8	and	5	are	13		12	less	5	leaves 7
9	and	5	are	14		13	less	5	leaves 8
10	and	5	are	15		14	less	5	leaves 9

1. Charles bought an inkstand for 8 cents and some pears for 4 cents; how much did both cost? $4+8=?$

2. He gave the clerk a 5-cent piece; how much more did he owe him? $12-5=?$

3. Two boys started from the same place; one went east 5 miles, the other went west 9 miles; how far apart were they then? $14-5=?$

4. Herbert's fish-line is 8 feet long and Frank's is 5 feet; how many feet long are both?

Add each column separately in the following examples, and write the answers below :

5.	6.	7.	8.	9.	10.	11.	12.
3	4	2	2	5	2	3	1
1	2	5	4	3	4	5	2
2	3	2	3	1	1	0	5
3	5	4	2	2	5	3	4

LESSON VI.

Copy and recite the following tables:

1	and	6	are	7		6	less	6	leaves 0
2	and	6	are	8		7	less	6	leaves 1
3	and	6	are	9		8	less	6	leaves 2
4	and	6	are	10		9	less	6	leaves 3
5	and	6	are	11		10	less	6	leaves 4
6	and	6	are	12		11	less	6	leaves 5
7	and	6	are	13		12	less	6	leaves 6
8	and	6	are	14		13	less	6	leaves 7
9	and	6	are	15		14	less	6	leaves 8
10	and	6	are	16		15	less	6	leaves 9

1. Robert has 9 rabbits and Joseph 6; how many have both? How many more has Robert than Joseph?

2. If Robert should lose 4 of his, how many would he have left? $6+9=?$ $9-4=?$ $9+6=?$

3. Lulu invited 8 little girls and 6 little boys to her birthday party; how many did she invite in all?

4. Three of the girls and one of the boys did not come; how many did she have at her party? $8-6=?$

Copy and add the following thus: in Ex. 5, say "four, six, seven, thirteen, sixteen."

5.	**6.**	**7.**	**8.**	**9.**	**10.**	**11.**	**12.**
3	2	1	2	7	4	5	4
6	3	3	4	2	2	2	5
1	7	4	6	4	3	6	8
2	4	2	5	3	8	4	3
4	2	5	6	5	6	2	8

LESSON VII.

Copy and recite the following tables:

1	and	7	are	8		7	less	7	leaves 0
2	and	7	are	9		8	less	7	leaves 1
3	and	7	are	10		9	less	7	leaves 2
4	and	7	are	11		10	less	7	leaves 3
5	and	7	are	12		11	less	7	leaves 4
6	and	7	are	13		12	less	7	leaves 5
7	and	7	are	14		13	less	7	leaves 6
8	and	7	are	15		14	less	7	leaves 7
9	and	7	are	16		15	less	7	leaves 8
10	and	7	are	17		16	less	7	leaves 9

1. In a reading class there are 14 pupils, 6 of whom are boys; how many girls are there? $8+7=?$ $14-7=?$

2. Helen made 9 pin-cushions for the fair, and Fannie made 5; how many did both make?

3. Lewis bought 13 peaches and gave 6 of them to his sister; how many had he left?

4. William picked 6 quarts of strawberries and Samuel 8 quarts; how many quarts did both pick?

Copy and add the following, naming results only:

5.	**6.**	**7.**	**8.**	**9.**	**10.**	**11.**	**12.**
2	4	2	4	2	4	2	1
1	3	2	3	3	2	2	3
5	2	5	2	4	3	4	5
3	2	4	4	5	2	2	3
4	5	1	1	2	5	1	6

From	10	9	12	14	11	13	15	16
Take	7	7	7	7	7	7	7	7

LESSON VIII.

Copy and recite the following table:

1	and	8	are	9	8	less	8	leaves	0
2	and	8	are	10	9	less	8	leaves	1
3	and	8	are	11	10	less	8	leaves	2
4	and	8	are	12	11	less	8	leaves	3
5	and	8	are	13	12	less	8	leaves	4
6	and	8	are	14	13	less	8	leaves	5
7	and	8	are	15	14	less	8	leaves	6
8	and	8	are	16	15	less	8	leaves	7
9	and	8	are	17	16	less	8	leaves	8
10	and	8	are	18	17	less	8	leaves	9

1. One rose-bush has 8 buds, another 4, another 3; how many have all? $14-8=?$ $9+8=?$

2. If you borrow 15 cents and return 8 cents, how much will you owe? $17-8=?$ $7+8=?$

3. Lillie is now 8 years old; how old will she be in 8 years?

4. Thomas has 7 credit-marks; how many more must he get to have 13?

To Teachers.—Pupils should be taught in all cases to add each number as a *whole*, not by counting the fingers or unit marks.

Copy and add the following:

5.	**6.**	**7.**	**8.**	**9.**	**10.**	**11.**	**12.**
6	4	7	8	1	6	8	8
2	2	2	1	7	5	1	1
1	5	4	3	2	2	6	7
3	7	3	5	6	1	4	2
5	3	5	4	5	8	5	3

LESSON IX.

Copy and recite the following table:

1	and	9	are	10		9	less	9	leaves 0
2	and	9	are	11		10	less	9	leaves 1
3	and	9	are	12		11	less	9	leaves 2
4	and	9	are	13		12	less	9	leaves 3
5	and	9	are	14		13	less	9	leaves 4
6	and	9	are	15		14	less	9	leaves 5
7	and	9	are	16		15	less	9	leaves 6
8	and	9	are	17		16	less	9	leaves 7
9	and	9	are	18		17	less	9	leaves 8
10	and	9	are	19		18	less	9	leaves 9

1. Jennie had 8 needles and her mother gave her 7 more; how many did she then have?

2. Eight and what number make 15?

3. In a class of 15 pupils, only 9 were punctual; how many were tardy? $17-9=?$ $9+8=?$

4. Fred. has 9 marbles and Frank 8; how many have both? 17 less 9 are how many? Less 8?

5. A window has 14 panes of glass and 6 are broken by hail-stones; how many whole panes are there?

6. A drum costs 9 dollars and a gun 8 dollars; how much do both cost?

Copy and find the answers to the following:

7.	**8.**	**9.**	**10.**
$3+4+6=?$	$5+8+2=?$	$7+3+6=?$	$8+4+5=?$
$5+3-4=?$	$6+4-7=?$	$7-4+2=?$	$8-3+5=?$

From	12	11	14	13	16	15	18	19
Take	9	9	9	9	9	9	9	9

LESSON X.

1. A shopkeeper sold 12 marbles to one lad, 8 to another, and 10 to another; how many did he sell to all?

2. If 1 rosebush has 8 buds, another 9, another 7, and another 4, how many buds have all?

3. If you pay 9 dollars for a music-box, 7 dollars for a flute, and 6 dollars for a drum, what will they all cost you?

4. Nine and what number make 13?

5. School opens at 9 o'clock; how many hours before it will be 12 o'clock? 9 and 3 are how many?

1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**
2	3	4	5	6	7	8	6
5	6	7	8	9	8	9	9
4	8	5	6	7	9	7	8
7	3	4	9	3	6	4	7
3	2	3	4	5	5	3	6

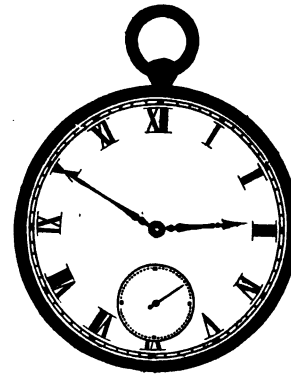
From	13	14	16	18	15	18	19	20
Take	7	3	5	6	6	7	8	9

Recite the following table:

XXI, twenty-one.	XXVI, twenty-six.
XXII, twenty-two.	XXVII, twenty-seven.
XXIII, twenty-three.	XXVIII, twenty-eight.
XXIV, twenty-four.	XXIX, twenty-nine.
XXV, twenty-five.	XXX, thirty.

Write in Roman Numerals: 9; 11; 13; 15; 14; 17; 19; 18; 20; 25; 28; 30. Write in figures: VII; IX; XVII; XIX; XVIII; XXVII; XXIX; XXX.

LESSON XI.



1. Into how many parts is the face of a watch divided?

Ans. 12 parts, called **Hours**, and 60 parts, called **Minutes**, each hour-space being 5 minutes.

2. What is the *smallest* hand on the watch-face called, and how often does it go around?

Ans. The **Second-hand** and goes around *once* a *minute.*

3. What the longest hand and how often does it go around?

Ans. It is called the **Minute-hand** and goes around *once* in an *hour;* pointing at XII at the end of each hour.

4. What the other hand and how often does that go around?

Ans. The **Hour-hand** and goes around once in 12 hours.

5. How long does it take the minute-hand to pass from XII to I? From I to II? etc. *Ans.* 5 minutes.

6. How long the hour-hand?

7. Where does each of these hands point at III o'clock?

8. What is the time shown by the watch in the picture?

9. To what will the long hand point at ten minutes past III?

10. When the hour-hand has passed III and the minute-hand points at V, what is the time?

11. When the hour-hand is at VIII and the minute-hand is at XII, what time is it by the watch?

12. Where will the hour and minute hands be at half-past XI?

LESSON XII.

Drill Exercises by Tens.

To TEACHERS.—The object of the next three Lessons is to familiarize the learner with the process of adding and subtracting by tens.

1. How many are 2 and 10? 12 and 10? 22 and 10? 32 and 10? 42 and 10? 52 and 10? 62 and 10? 72 and 10? 82 and 10? 92 and 10?

2. 12 less 10? 22 less 10? 32 less 10? 42 less 10? 52 less 10? 62 less 10? 72 less 10? 82 less 10? 92 less 10?

3. 3 and 10? 13 and 10? 23 and 10? 33 and 10? 43 and 10? and so on up to 93 and 10?

4. 13 less 10? 23 less 10? 33 less 10? 43 less 10? and so on to 93 less 10?

5. 4 and 10? 14 and 10? 24 and 10? 34 and 10? 44 and 10? etc., to 94 and 10?

6. 14 less 10? 24 less 10? 34 less 10? 44 less 10? 54 less 10? etc., to 94 less 10?

7. 5 and 10? 15 and 10? 25 and 10? 35 and 10? 45 and 10? etc., to 95 and 10?

8. 15 less 10? 25 less 10? 35 less 10? 45 less 10? 55 less 10? etc., to 95 less 10?

9. John had 44 cents and earned 10 cents more; how many cents had he then?

10. Edward had 53 peaches in his basket and gave 10 to his brother; how many had he left?

11. A man had 68 pounds of sugar and sold 10 pounds; how many pounds had he left?

12. If 57 pounds of butter are in a tub, and 10 more are added, how many pounds will the tub contain?

LESSON XIII.

Drill Exercises Continued.

1. How many are 6 and 10? 16 and 10? 26 and 10? 36 and 10? 46 and 10? 56 and 10? 66 and 10? 76 and 10? 86 and 10? 96 and 10?

2. 16 less 10 are how many? 26 less 10? 36 less 10? 46 less 10? etc., to 96 less 10?

3. 7 and 10? 17 and 10? 27 and 10? 37 and 10? 47 and 10? etc., to 97 and 10?

4. 17 less 10? 27 less 10? 37 less 10? etc., to 97 less 10?

5. 8 and 10? 18 and 10? 28 and 10? etc., to 98 and 10?

6. 18 less 10? 28 less 10? 38 less 10? etc., to 98 less 10?

7. 9 and 10? 19 and 10? 29 and 10? etc., to 99 and 10?

8. 19 less 10? 29 less 10? etc., to 99 less 10?

9. A farmer had a flock of 59 sheep; he sold 10 of them, and 10 more died; how many sheep were left?

10. George earns 10 dollars a week; he had 78 dollars in the savings bank, and added to it the wages of 2 weeks to-day, how much has he in all?

	11.	**12.**	**13.**	**14.**	**15.**	**16.**	**17.**	**18.**
To	25	34	45	56	47	62	84	98
Add	10	10	10	10	10	10	10	10
From	27	36	44	53	62	78	89	91
Take	10	10	10	10	10	10	10	10

LESSON XIV.

Drill Exercises Continued.

1. How many are 9 and 3? 19 and 3? 29 and 3? 39 and 3? 49 and 3? 59 and 3? 69 and 3? 79 and 3? 89 and 3? 99 and 3?

2. How many are 12 less 3? 22 less 3? 32 less 3? 42 less 3? 52 less 3? 62 less 3? 72 less 3? 82 less 3? 92 less 3?

3. How many are 9 and 4? 19 and 4? 29 and 4? etc., to 99 and 4?

4. How many are 13 less 4? 23 less 4? 33 less 4? etc., to 93 less 4?

5. 8 and 5? 18 and 5? 28 and 5? etc., to 98 and 5?

6. 13 less 5? 23 less 5? 33 less 5? etc., to 93 less 5?

7. 6 and 6? 16 and 6? 26 and 6? etc., to 96 and 6?

8. 12 less 6? 22 and 6? 32 less 6? etc., to 92 less 6?

9. 7 and 7? 17 and 7? 27 and 7? etc., to 97 and 7?

10. 14 less 7? 24 less 7? 34 less 7? etc., to 94 less 7?

11. 8 and 4? 18 and 4? 28 and 4? etc., to 98 and 4?

12. 12 less 4? 22 less 4? 32 less 4? etc., to 92 less 4?

13. 9 and 5? 19 and 5? 29 and 5? etc., to 99 and 5?

14. 14 less 5? 24 less 5? 34 less 5? etc., to 94 less 5?

15. 6 and 8? 16 and 8? 26 and 8? etc., to 96 and 8?

16. 16 less 8? 26 less 8? 36 less 8? etc., to 96 and 8?

17. The gray hen had 26 chickens, but 8 of them died; how many were left?

18. James found 38 chestnuts under one tree, 8 under another, and John gave him 8 more; how many had he in all?

LESSON XV.

Drill Exercises Continued.

1. How many are 6 and 9? 16 and 9? 26 and 9? 36 and 9? 46 and 9? 56 and 9? 66 and 9? 76 and 9? 86 and 9? 96 and 9?

2. 15 less 9? 25 less 9? 35 less 9? 45 less 9? 55 less 9? 65 less 9? 75 less 9? 85 less 9? 95 less 9?

3. 9 and 8? 19 and 7? 29 and 7? etc., to 99 and 7?

4. 16 less 7? 26 less 7? 36 less 7? etc., to 96 less 7?

5. 7 and 8? 17 and 8? 27 and 8? etc., to 97 and 8?

6. 15 less 8? 25 less 8? 35 less 8? etc., to 95 less 8?

7. 8 and 4? 18 and 4? 28 and 4? etc., to 98 and 4?

8. 12 less 4? 22 less 4? 32 less 4? etc., to 92 less 4?

9. 7 and 6? 17 and 6? 27 and 6? etc., to 97 and 6?

10. 23 less 6? 33 less 6? 43 less 6? etc., to 93 less 6?

11. 9 and 8? 19 and 8? 29 and 8? etc., to 99 and 8?

12. 17 less 8? 27 less 8? 37 less 8? etc., to 97 less 8?

13. Robert had 68 dollars and his father gave him 5 dollars more; how many dollars had he then?

14. Count by *twos* from 50 to 100, and back.

15. Count by *fives* from 50 to 100, and back.

16. Count by *tens* from 50 to 100, and back.

	17.	**18.**	**19.**	**20.**	**21.**	**22.**	**23.**	**24.**
To	37	42	64	59	83	69	78	94
Add	5	6	7	8	6	7	10	9
From	54	63	70	87	74	82	98	99
Take	6	8	9	3	6	7	8	5

LESSON XVI.

1. A farmer sold 5 bushels of corn to one man, 6 to another, and 3 to another; how many bushels did he sell?

Ans. 5 bu. and 6 bu. are 11 bu., and 3 bu. are 14 bu.?

2. If you pay 7 cents for candy, 5 cents for an orange, and 3 cents for a pear, how many cents will you pay for all?

3. How many are 8 cents, and 9 cents, and 7 cents?

4. How many are 5 plums, and 6 plums, and 8 plums?

Add the following columns at sight:

5.	6.	7.	8.	9.	10.	11.	12.
6	4	4	7	2	5	4	9
7	6	1	1	5	2	7	4
5	0	0	2	8	9	9	6
2	2	9	8	3	6	5	7
3	8	5	6	4	1	8	8
6	3	7	9	1	4	6	9

Recite the following table:

XXX,	thirty.	XL,	forty.
XXXI,	thirty-one.	XLI,	forty-one.
XXXII,	thirty-two.	XLII,	forty-two.
XXXIII,	thirty-three.	XLIII,	forty-three.
XXXIV,	thirty-four.	XLIV,	forty-four.
XXXV,	thirty-five.	XLV,	forty-five.
XXXVI,	thirty-six.	XLVI,	forty-six.
XXXVII,	thirty-seven.	XLVII,	forty-seven.
XXXVIII,	thirty-eight.	XLVIII,	forty-eight.
XXXIX,	thirty-nine.	XLIX,	forty-nine.

LESSON XVII.

1. Write the largest number expressed by two figures.
2. Write one hundred in figures.
3. One hundred and one. *101.*
4. One hundred and two. *102.*
5. One hundred and three. *103*, etc.
6. One hundred and ten. *110.*
7. One hundred and eleven. *111.*
8. One hundred and twelve. *112*, etc.
9. One hundred and twenty. *120.*
10. One hundred and thirty. *130.*
11. One hundred and fifty. *150.*
12. One hundred and ninety. *190.*
13. Two hundred. *200*, etc.

14. Write in figures the numbers from 120 to 130, and so on to one hundred and ninety-nine.

15. Write in figures the hundreds from two hundred to nine hundred.

16. Write nine hundred ninety-nine in figures.

17. How many are 999 and 1 more?

Ans. **One thousand.**

18. How is a thousand expressed?

Ans. By writing 1 in the *fourth* place with three 0's on the right; thus, *1000.*

19. What does each figure denote in 1345, and how read?

Ans. It denotes 5 units, 4 tens, 3 hundreds, and 1 thousand; and is read "one thousand three hundred forty-five."

20. Copy and read the following numbers:

125; 236; 342; 185; 276; 541; 463; 502; 630; 729; 1521; 1452; 1670; 1295; 1605; 1346; 1009.

LESSON XVIII.

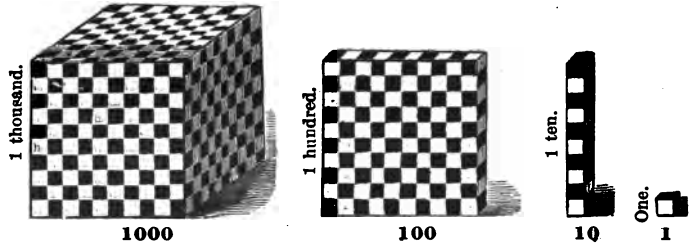
1. Write the largest number expressed by one figure.

2. Write the smallest number expressed by two figures. Write the largest.

3. Write the smallest number expressed by three figures. The largest.

4. How is a thousand expressed?

Ans. By writing 1 in the fourth place with 3 ciphers on the right.



5. How many ones in 1 ten? In 1 hundred?

6. How many ones in 1000?

7. How much greater is 1 ten than one?

8. How much greater is 1 hundred than 1 ten?

9. How much greater is 1 thousand than 1 hundred?

10. What does a figure standing in the first place denote? In the second? In the third? In the fourth?

11. How much greater is the value of a figure standing in the *second* place than in the *first*?

12. In the *third* place than in the *second*?

13. In the *third* place than in the *first*?

14. How much greater in the *fourth* place than in the third? Than in the second? Than in the first?

LESSON XIX.

1. Charles picked 4 cherries from one stem, 3 from another, 5 from another, and 6 from another; how many cherries did he pick?

2. Represent this on your slate by figures and signs?

3. Howard paid 9 cents for a ball, 8 cents for a kite, and 4 cents for twine; he gave 25 cents in payment; how much change ought he to receive?

4. If a man earns 30 dollars a month and it costs him 10 dollars for board, 8 dollars for clothing, and 3 dollars for other expenses, how much can he save in a month?

5. A young man deposited 50 dollars in a savings bank; at one time he drew out 8 dollars, at another 10 dollars, at another 5 dollars; how much had he left on deposit?

6. George was sent with 50 cents to buy vegetables; he paid 28 cts. for potatoes, 10 cts. for radishes, and 5 cts. for salt; how much change did he bring back?

Add the following at sight:

7.	**8.**	**9.**	**10.**	**11.**	**12.**	**13.**	**14.**
4	8	7	5	3	3	9	8
5	2	9	6	4	5	8	3
2	6	3	2	7	4	3	7
4	2	1	5	3	2	4	8
3	5	2	3	8	4	2	3
7	3	8	6	2	7	6	6

	15.	**16.**	**17.**	**18.**	**19.**	**20.**	**21.**	**22.**
From	43	38	54	63	76	82	83	97
Take	6	5	7	8	5	7	9	8

LESSON XX.

REVIEW.

1. What do figures denote standing in the *first* place on the right?

2. What is the largest number expressed by one figure?

3. What do figures denote standing in the *second* place?

4. How many tens and units in 45? 63? 87? 78? 99?

5. What is the largest number expressed by two figures?

6. What do figures denote standing in the *third* place?

7. What does each figure denote in 324, and how read?

Ans. Four units, two tens, and three hundreds; and the number is read "three hundred twenty-four.

8. Read the numbers 231; 683; 451; 724; 730; 842; 999.

9. What is the largest number expressed by three figures?

10. What do figures denote standing in the *fourth* place?

11. Write in figures one thousand; two thousand; five thousand.

12. What does each figure denote in 1634, and how read?

Ans. The first figure on the right denotes 4 units, the second 3 tens, the third 6 hundreds, the fourth 2 thousands; the number is read "one thousand six hundred thirty-four."

13. Write in figures, one thousand; seven hundred twenty-three; one thousand two hundred ten.

Copy and read the following numbers:

14. 162.	18. 2174.	22. 4283.	26. 1192.
15. 1080.	19. 614.	23. 1035.	27. 1628.
16. 1500.	20. 1820.	24. 1208.	28. 1402.
17. 1063.	21. 1040.	25. 1540.	29. 1999.

(See Appendix, p. 135.)

SECTION III.

ADDITION AND SUBTRACTION.

LESSON I.

1. How many clusters of grapes are in this picture?

2. How many grapes in the upper cluster?

3. How many in the middle cluster?

4. How many in the lower one?

5. How many grapes in all the clusters?

6. How many are 12+8+12?

7. How many leaves are on the vine?

8. If you take away the upper cluster, how many grapes will be left?

9. Take away the middle cluster; how many grapes are left?

10. Count by 2's from 50 to 100.

11. Count by 3's from 50 to 100.

12. Count by 4's from 50 to 100.

13. Count by 5's and by 10's from 50 to 100, and back.

Copy and complete the following:

14. $27+5+8=?$ $36+7-4=?$ $48+6+7=?$

15. $54+9-6=?$ $63-4+7=?$ $55+10-6=?$

LESSON II.

ORAL EXERCISES.

1. If a pineapple costs 12 cents, an orange 6 cents, and a pear 4 cents, how much will all cost?

Ans. 12 cts. and 6 cts. are 18 cts., and 4 are 22 cents.

2. Henry gave 12 cents for a writing-book, 6 cents for an inkstand, and 5 cents for a pencil; what did he pay for all?

3. Edward gave 9 dollars for a bicycle, 3 dollars for skates, and 2 dollars for a sled; what did the whole cost?

4. Sadie had 45 cents in her money-box, and took out 9 for the Sunday-school collection; how much was left?

Ans. Taking 9 cents from 45 cents leaves 34 cents.

5. Susan's rosebush has 12 buds and 8 roses on it; how many roses will she have had when the buds open?

6. If she picks off 5 roses, how many will be left?

WRITTEN EXERCISES.

Add the following at sight:

1.	2.	3.	4.	5.	6.	7.	8.
9	5	4	7	6	5	8	9
6	1	3	4	4	2	5	3
5	6	6	2	2	9	4	5
3	7	2	6	5	4	9	8
7	4	7	3	7	3	6	7
4	2	4	2	3	5	2	6

From	27	34	52	43	76	82	67	94
Take	3	5	6	4	7	9	8	7

LESSON III.

1. Willie had 24 chestnuts; he gave 7 to one brother and 8 to another; how many did he have left?

Ans. 7 chestnuts and 8 chestnuts are 15 chestnuts; and 15 chestnuts from 24 chestnuts leave 9 chestnuts?

2. Susie had 12 roses; on her way to school she lost 3, and gave 2 away; how many had she left?

3. James had 3 broods of chickens; one contained 7, another 5; another 8; but 7 of them were killed by a fox; how many were left?

4. Joseph's kite-line was 9 yards long; he afterwards tied on 7 yds. more, and then lost 3 yds.; how many yards were left?

5. Beginning with 1, count thirty by 2's and back.

Thus, one, three, five, seven, etc.

6. Beginning with 1, count by 3's to thirty-one and back.

7. Beginning with 1, count by 4's to forty-one.

8. Beginning with 1, count by 5's to fifty-one.

9.	**10.**	**11.**	**12.**	**13.**	**14.**	**15.**	**16.**
8	7	6	5	9	8	6	9
5	3	4	7	1	7	7	5
3	1	1	1	6	6	2	1
2	5	6	2	3	1	3	3
4	2	5	4	5	2	5	6
6	4	3	5	4	3	4	2

	17.	**18.**	**19.**	**20.**	**21.**	**22.**	**23.**	**24.**
From	48	53	62	74	68	77	86	94
Take	5	7	6	7	9	8	7	9

LESSON IV.

ORDINAL NUMBERS.

1. What are the words *First, Second, Third, Fourth,* etc., called?

Ans. They are called **Ordinal Numbers.**

2. How many rounds has the ladder in the picture?

3. If we call the lowest round the **First,** what is the next called?

Ans. **Second.**

4. The next? **Third.**
5. The next? **Fourth.**
6. The next? **Fifth.**
7. The next? **Sixth.**
8. The next? **Seventh.**
9. The next? **Eighth.**
10. The next? **Ninth.**
11. The next? **Tenth.**

12. Beginning at this end of the class, name the first pupil. The second. The third. Fourth. Fifth, etc.

13. What is the finger next the thumb called?

Ans. "The *first* finger."

14. What is the next called? The next? The next?

15. How many rounds in the ladder below the fifth? How many above it?

16. How many rounds below the seventh? How many above it?

17. Ordinal numbers are expressed by figures; thus,

1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th.
First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, Tenth.

LESSON V.

1. Write the largest number that can be expressed by *two* figures.

2. Write a hundred in figures.

3. How many tens make a hundred? How many ones?

4. How many ones in 200? How many tens?

5. Write the largest number expressed by *three* figures?

6. Write one thousand in figures.

7. Write one thousand and one unit, or one.

8. Write one thousand and one ten.

9. Write one thousand and one hundred.

10. Write one thousand, one hundred, one ten, and one.

11. Write two thousand in figures. Three thousand. Five thousand. And so on to nine thousand.

12. Write two thousand three hundred.

13. Write three thousand four hundred twenty.

14. Write five thousand three.

15. Read the following numbers: 2345, 4310, 3206, 5042, 6208, 4693, 8040, 9999, 208, 1005, 6070, 4025, 6301, 9552.

16.	**17.**	**18.**	**19.**	**20.**	**21.**	**22.**	**23.**
4	5	6	5	6	5	8	9
5	4	3	4	7	6	9	7
6	8	4	3	8	7	7	5
3	7	5	2	9	9	6	6
2	3	2	7	1	4	4	8
7	2	9	8	7	8	5	4

From	49	52	63	75	69	78	87	95
Take	6	7	8	6	7	8	7	9

LESSON VI.

1. When a number has 4 figures, what does the figure in the first place on the right denote? The second? Third? Fourth?

2. Write the largest number expressed by 4 figures?

3. What is 9999 and 1 more called?

Ans. **Ten thousand.**

4. How is ten thousand expressed?

Ans. By writing 1 in the *fifth* place, with four 0's on the right. Thus, *10000*

5. What does a figure in the *fifth* place denote?

Ans. **Ten-Thousands.**

6. Name the five places of figures beginning at the right.

Ans. Units, tens, hundreds, thousands, ten-thousands.

7. Write in figures, three ten-thousands, four thousands, two hundreds, five tens, and six units.

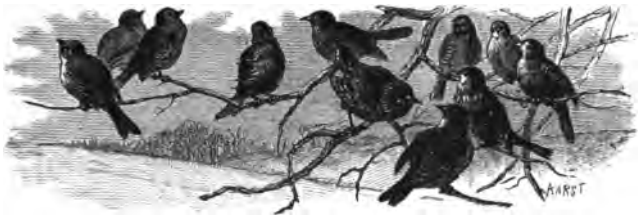
8. Write five ten-thousands, six thousands, three hundreds, four tens, eight units.

9. Write sixty-four thousands, five hundreds, twenty-eight, and read the number, naming the units, tens, etc.

Ans. 64528, which is equal to 6 ten-thousands, 4 thousands, 5 hundreds, 2 tens, and 8 units, and is read, sixty-four thousand five hundred twenty-eight.

10. Write eight ten-thousands, four thousands, six hundreds, seven tens, and three units.

11. Write the following in figures: one hundred twenty-seven; two thousand seventy-nine; three thousand four; four thousand sixty-three; seven hundred twenty; six thousand eight hundred eighty-nine; nine thousand seven hundred eighty-four.



LESSON VII.

1. How many birds are in the picture?
2. How many wings has each?
3. How many wings have all of them?
4. If a hunter shoots 4 of them, how many will be left?
5. A teacher had 43 pupils present, and 8 were absent; how many pupils had she?
6. Of those present 9 were late; how many were early?
7. One of my orange trees has 36 oranges and another has 9, and another 12; how many have all?
8. Eight from 45 leaves how many?
9. Edward had 12 picture-books and his aunt gave him 9 more; how many did he then have?

10.	11.	12.	13.	14.	15.	16.	17.
6	4	5	4	7	6	9	8
5	1	4	8	3	5	8	5
3	6	6	2	4	3	4	9
4	5	3	5	5	5	5	6
8	3	2	3	8	7	7	8
2	4	7	4	6	8	6	7
From	35	49	68	58	78	88	99
Take	14	36	45	34	28	57	68

LESSON VIII.

1. A man bought a cow for 36 dollars and sold her for 8 dollars less than cost; how much did he get for her?

2. John had 12 cents and his father gave him 20; how many more must he get to have 40 cents?

3. Sixty-four and what number make 72?

4. Seventy-five and what number make 84?

5. If you have 24 dollars and earn 9 dollars and spend 6 dollars, how much have you left?

6. If you are now 9 years old, in how many years will you be 17?

7. What is the largest number that can be expressed by five figures, and how is it read?

Ans. 99999; ninety-nine thousand nine hundred ninety-nine.

8. If you add 1 to 99999, what is the number called?

Ans. **One hundred thousand.**

9. Write this number in figures; thus, *100000*

10. Write in figures one hundred thousand and one.

11. Write one hundred one thousand one hundred one.

12. Write one hundred twenty-five thousand.

13. Write one hundred three thousand four hundred five; one hundred thousand fifty; one hundred thousand ten.

Copy and add the following, beginning at the right:

14.	15.	16.	17.	18.
34125	41032	32541	54321	42013
41531	25413	13235	12456	23542
12232	12323	24122	20211	10221

LESSON IX.

ORAL EXERCISES.

1. William gave 68 cents for a canary-bird and 12 cts. for seed to feed it with; what did he pay for both?

2. If it takes a lad 8 minutes to do one example, 10 minutes to do another, and 6 minutes to do another, how long will it take him to do the 3 examples?

3. Horace paid 18 cents for figs, 16 cents for cherries, and 5 cents for an orange; what did he pay for all?

4. Julia has 9 dolls and Lizzie 8; how many have both?

5. From a cellar containing 15 barrels of apples, 8 barrels were taken; how many were left?

6. In a chamber there are 16 chairs; if 8 of them are taken away, how many will be left?

7. Nine and what make 16? 9 and what make 15?

8. Twelve is how many more than 9? 13 than 9?

WRITTEN EXERCISES.

9. Add the following, beginning at the bottom.

2	2	3	3	3	4	4	4	4
2	2	3	3	3	4	4	4	4
2	2	3	3	3	4	4	4	4
2	2	3	3	3	4	4	4	4
2	2	3	3	3	4	4	4	4
2	1	3	1	2	4	1	2	3

From	235	346	457	568	469
Take	123	124	322	423	127

LESSON X.

ORAL EXERCISES.

1. If you give 32 chestnuts to one playmate, 6 to another, and 8 to another, how many will you give to all?

2. If one tree bears 10 peaches, another 19, and another 8, how many will all bear?

3. If you have 22 marbles, you buy 10, and Charles gives you 8 more, how many will you have?

4. From a livery stable containing 23 horses, 8 were taken out; how many were left?

5. Eight lozenges from 21 lozenges leave how many?

6. A school-boy having 25 cents in his pocket, gave all but 10 to a blind man; how many did he give him?

7. Henrietta is 18 years old and George 12; what is the difference between their ages? What is the sum of their ages?

8. Arthur's lesson had 24 examples; he solved 8 in school; how many remain to be solved at home?

WRITTEN EXERCISES.

9. Add the following, beginning at the bottom:

5	5	5	5	5	6	6	6	6	6
5	5	5	5	5	6	6	6	6	6
5	5	5	5	5	6	6	6	6	6
5	5	5	5	5	6	6	6	6	6
5	5	5	5	5	6	6	6	6	6
5	1	2	3	4	6	1	2	3	4

From	456	548	637	748	859
Take	134	423	312	515	324

LESSON XI.

1. What are the figures which stand for the first *nine* numbers called, and why?

Ans. **Significant figures** or **Digits,** because they always denote *some* number.

2. What is the character 0 called?

Ans. It is called **Naught, Cipher,** or **Zero.**

3. What does it denote?

Ans. When alone it denotes *no number,* when with other figures it denotes the *absence* of units in its place.

4. What does the figure 5 standing alone denote?

Ans. 5 units or ones.

5. When in the second place with a *naught* on the right?

Ans. 5 tens or fifty, written 50.

6. When in the the third place?

Ans. 5 hundreds, written 500.

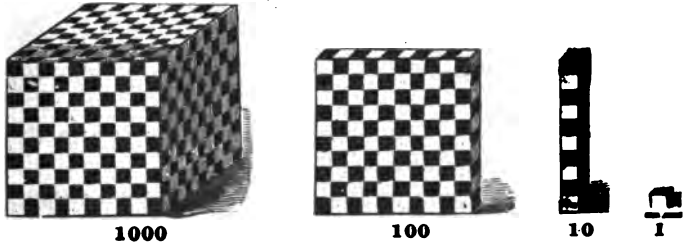
7. What is the effect of removing a figure one place towards the left?

Ans. It increases its value *ten* times.

8. If removed *two* places, what is the effect?

Ans. Its value is increased a *hundred* times.

These different values are illustrated by the following diagram:



1000 **100** **10** **1**

LESSON XII.

1. What are the different values expressed by the same figure standing in different places called?

Ans. Different **Orders of Units.**

2. What are the names of the *first six* orders of units?

Ans. Units, tens, hundreds, thousands, ten thousands, hundred thousands.

These different values expressed by the same figure may be shown by writing the names of the orders of units in succession and placing the figure under the order to which it belongs, as in the following table.

Thus, 2 standing in the first place denotes 2 *units.*

Standing in the second place, as in 20, it denotes 2 *tens.*

In the third place, as in 200, it denotes 2 *hundreds.*

In the fourth place, as in 2000, it denotes 2 *thousands.*

In the fifth place, as in 20000, it denotes 2 *ten-thousands.*

In the sixth place, as in 200000, it denotes 2 *hundred-thousands.*

Hund. thou.	Ten thou.	Thousands.	Hundreds.	Tens.	Units.
					2
				2	0
			2	0	0
		2	0	0	0
	2	0	0	0	0
2	0	0	0	0	0
2	2	2	2	2	2

3. Read the sum of these different values of 2.

Ans. Two hundred twenty-two thousand two hundred twenty-two.

4. Name the order of units denoted by each figure in the following number: 524368; and read it.

Ans. 8 units, 6 tens, 3 hundreds, 4 thousands, 2 ten-thousands, 5 hundred thousands.

LESSON XIII.

1. How many figures are required to express hundreds?
2. How many to express thousands?
3. To express ten-thousands? Hundred-thousands?
4. Write two hundred three. Four hundred eleven.
5. Write two thousand four hundred one.
6. Write three thousand fifty-six. Nine thousand twenty.
7. Ten thousand. Fifteen thousand five.
8. Twenty-four thousand three hundred ten.
9. Thirty-nine thousand eleven.
10. Fifty-seven thousand three hundred.
11. Eighty-six thousand nine.
12. Ninety thousand nine hundred nine.
13. Ninety-nine thousand nine.
14. One hundred thousand.
15. Two hundred fifty-three thousand eleven.
16. Four hundred four thousand fourteen.
17. Eight hundred eighteen thousand twenty.
18. Nine hundred thousand fourteen.
19. Nine hundred nineteen thousand nine hundred nineteen.

Read the following numbers:

20. 310.	27. 7600.	34. 52625.	41. 125643.
21. 415.	28. 4052.	35. 38900.	42. 250046.
22. 840.	29. 8207.	36. 71005.	43. 82420.
23. 907.	30. 24356.	37. 4203.	44. 5613.
24. 1235.	31. 35200.	38. 59206.	45. 92400.
25. 3042.	32. 6110.	39. 60075.	46. 465030.
26. 8205.	33. 7907.	40. 89200.	47. 600040.

LESSON XIV.

ORAL EXERCISES.

1. How many tens are 2 tens and 1 ten?

2. How many are 2 tens and 3 tens?

3. A farmer sold 20 bushels of wheat to one man and 40 bushels to another; how many did he sell to both?

SOLUTION.—20 is 2 tens and 40 is 4 tens; 2 tens and 4 tens are 6 tens, or 60. *Ans.* 60 bushels.

4. Arthur paid 20 cents for a Reader, 40 cents for an Arithmetic; how much did he pay for both?

5. If a teacher earns 60 dollars a month and spends 20 dollars, how much a month will she save?

SOLUTION.—60 dollars are 6 tens and 20 dollars are 2 tens; now 2 tens from 6 tens leave 4 tens, or 40 dollars, *Ans.*

6. On a tree were 40 sparrows and 20 robins; how many birds were on the tree?

7. If 20 sparrows and 10 robins fly away, how many birds will remain?

WRITTEN EXERCISES.

Copy and complete the following:

8.	**9.**	**10.**	**11.**
$20+30=?$	$30+40-10=?$	$50-20=?$	$40+80=?$
$40-20=?$	$40-30+10=?$	$90-30=?$	$50+60=?$
$50+30=?$	$80-50+20=?$	$20+90=?$	$60+70=?$

From	30	40	50	60	70	80
Take	20	30	30	20	50	30

LESSON XV.

ORAL EXERCISES.

1. A man sold a wagon for 45 dollars and a sleigh for 23 dollars; how much did he get for both?

SOLUTION.—45 is the same as 4 tens and 5 units; 23 is the same as 2 tens and 3 units. Now 4 tens + 2 tens are 6 tens, or 60; 5 units + 3 units are 8 units, and 60 dollars + 8 dollars are 68 dollars, *Ans.*

2. In a certain school there are 25 pupils in one class and 32 in another; how many in both classes?

3. A farmer bought a horse for 72 dollars and a cow for 35 dollars; how much did he pay for both?

4. How many are 68 and 21? 56 and 23? 64 and 43?

5. A Geography costs 55 cents and a Grammar 42 cents; what is the cost of both?

WRITTEN EXERCISES.

Add the following, beginning at the bottom:

7	7	7	7	8	8	8	9	9	9
7	7	7	7	8	8	8	9	9	9
7	7	7	7	8	8	8	9	9	9
7	7	7	7	8	8	8	9	9	9
7	1	2	3	8	1	2	9	1	2

Recite the following table:

L,	50.	LIV,	54.	LVIII,	58.
LI,	51.	LV,	55.	LIX,	59.
LII,	52.	LVI,	56.	LX,	60.
LIII,	53.	LVII,	57.	LXI,	61.

LESSON XVI.

ORAL EXERCISES.

1. Lulu bought a spool of silk for 17 cents, a dozen buttons for 12 cents, and a piece of braid for 6 cents; how much did she pay for all?

2. She paid for them with a 50-cent piece; how much change should she have?

3. A father paid 15 dollars for a coat for his eldest boy, and 12 dollars for a vest; what did he pay for both?

4. In a pasture are 4 oxen, 8 cows, 2 calves and 2 horses; how many animals are in the pasture?

5. If the oxen and horses are taken out, how many animals will be left?

WRITTEN EXERCISES.

Copy and add the following at sight:

6.	7.	8.	9.	10.	11.	12.	13.
2	4	6	5	7	6	8	9
7	8	5	4	5	3	4	6
1	2	1	3	3	4	5	7
5	4	3	6	7	8	9	3
4	3	4	2	4	3	3	8
2	6	8	7	9	5	7	3
3	5	3	6	6	2	4	5
2	3	4	5	4	6	8	9
5	6	5	4	2	5	6	3

14. From	45	52	38	47	54	63	72
Take	6	7	8	6	7	8	9

LESSON XVII.

Complete and recite the following table:

LXI,	61.	LXXIII,	73.	LXXXV,	85, etc.
LXII,	62.	LXXIV,	74.	XC,	90.
LXIII,	63.	LXXV,	75, etc.	XCI,	91.
LXIV,	64.	LXXX,	80.	XCII,	92.
LXV,	65, etc.	LXXXI,	81.	XCIII,	93.
LXX,	70.	LXXXII,	82.	XCIV,	94.
LXXI,	71.	LXXXIII,	83.	XCV,	95.
LXXII,	72.	LXXXIV,	84.	C,	100.

Add the following columns at sight:

1.	2.	3.	4.	5.	6.	7.	8.
7	5	6	8	7	8	7	9
4	7	7	5	5	5	4	8
6	0	5	6	9	6	0	7
3	3	2	0	0	4	7	6
5	8	4	8	6	0	8	5
0	6	6	4	8	7	6	7
7	7	8	3	0	2	0	8
6	4	9	6	4	8	9	0
4	5	5	7	3	6	8	6
5	7	4	5	6	9	7	9

From	246	357	468	579	688
Take	122	245	353	354	346

Write the following in columns, placing units under units, tens under tens, etc., and read the numbers: 236500; 42836; 7849; 25069; 789; 7431; 27203; 48000; 275432; 89041.

LESSON XVIII.

ORAL EXERCISES.

1. $30+15=?$	7. $50+18=?$	13. $70+16=?$
2. $30+21=?$	8. $50+22=?$	14. $70+21=?$
3. $30+28=?$	9. $60+18=?$	15. $60+35=?$
4. $40+17=?$	10. $50+24=?$	16. $40+42=?$
5. $40+25=?$	11. $60+25=?$	17. $60+33=?$
6. $40+36=?$	12. $60+31=?$	18. $70+29=?$

19. A man earned 48 dollars a month, paid 8 dollars for rent, and 20 dollars for provisions; how much had he left?

20. Henry bought a writing-book for 20 cents, an inkstand for 60 cents, and pens for 15 cents; he paid for them with a dollar bill; how much change should he have?

21. 35 less $(10+8+5)$ = how many?

22. Robert picked 12 oranges from one tree, 18 from another, and 20 from another; he afterwards gave 7 to his sister and 8 to her friend; how many had he left?

WRITTEN EXERCISES.

Copy and add the following, setting down the full sum of the left-hand column of each example.

23.	24.	25.	26.	27.	28.
50	81	41	50	300	401
81	70	20	41	401	600
40	92	32	30	201	510
32	40	50	22	300	900
20	61	21	40	511	314
61	50	60	13	610	620

LESSON XIX.

ORAL EXERCISES.

1. Beginning with one, name every other number to twenty; as, one, three, five, etc.

2. Beginning with twenty, name every other number backward to one.

3. Beginning with one, name every third number to twenty. Thus. one, four, seven, etc.

4. Beginning with twenty, do the same backward to one.

5. What number $= 30+15+10$? What $= 40+16-8$?

WRITTEN EXERCISES.

Copy and add the following as before:

6.	7.	8.	9.	10.	11.
231	132	321	411	502	812
100	410	500	512	311	720
421	600	741	600	620	431
502	312	602	230	810	601
711	501	301	702	602	812
600	420	762	611	712	900
820	701	600	820	500	710
400	300	501	700	430	801
510	220	820	411	601	911
601	802	711	600	700	800

12. Write in Roman Numerals: thirty-four; twenty-six; forty-five; thirty-seven; forty-eight; twenty-nine; forty-four; thirty-two; twenty-eight; forty-nine.

LESSON XX.

REVIEW.

1. One pupil gave the teacher 4 peaches, another 8 peaches, and another 18 peaches; how many peaches did she receive from all?

2. Ada lives 4 blocks from school, Edith lives 5 blocks beyond Ada, and Grace lives 8 blocks beyond Edith; how many blocks from school does Grace live?

3. Howard gathered 10 quarts of chestnuts, Roland 20 quarts, and Walter 30 quarts; how many quarts did they have in all?

4. In a class of 45 pupils, 12 were absent; how many were present? $45+12=?$

5. Henry had 75 credit marks, and lost 23 by misconduct; how many had he left? $75+23=?$

6. Two boys put their savings in one bank; Charles put in 75 cents and John 52; how many cents did both put in? How many more did Charles put in than John?

7. What is uniting two or more numbers in one called?

8. What is the result or answer called in addition?

9. Make the sign of addition on the slate or blackboard.

10. What is taking away a part of a number called?

11. What is the result or answer called in subtraction?

12. Make the sign of subtraction. The sign of equality.

Express the following by figures and signs.

13. Twenty-five and eight and ten are forty-three.

14. Thirty-four and six, less nine, are thirty-one.

15. Forty-three less seven equals twenty-seven and nine.

(See Appendix, p. 137.)

SECTION IV.

LESSON I.

Adding when the sum of a column is more than nine.

1. What is the sum of 726, 965, and 687?

ILLUSTRATION.—We write the numbers as in the margin. Beginning at the right, we find the sum of the units is 18, the sum of the tens is 16, and the sum of hundreds is 22. Adding these partial sums, units to units, tens to tens, etc., the entire sum is 2378, *Ans.*

Instead of setting the sum of each column in a separate line, there is a shorter and better way.

726
965
687

18 = Units.
16 = Tens.
22 = Hundreds.

2378 = Entire sum.

DIRECTIONS.—Write the numbers one under another, units under units, tens under tens, etc. The sum of the 1st col. is 18 units, or 1 ten and 8 units. Set the 8 under the units, and add the 1 to the tens, making 17 tens, or 1 hundred and 7 tens. Write the 7 tens under the tens, and add the 1 to the hundreds, making 23 hundreds, which we set down in full. That is, we set the right hand figure or units of the sum of each column under the column added, and add the tens to the next column.

726
965
687
Ans. 2378

PROOF.—Begin at the top and add the columns downward; if the second result is the same as the first, the work is right.

NOTE.—When the *sum* of a column is *ten* or *more*, adding the *tens* figure to the next column is called **Carrying Tens.**

LESSON II.

Add and prove the following:

1. What is the sum of 452, 617, 624, 373?
2. What is the sum of 147, 307, 249, 374?
3. What is the sum of 4160, 3248, 5167, 4235?

4.	5.	6.	7.	8.
2438	3576	5463	2762	3584
2107	2234	2872	3254	7132
3352	7163	6435	4872	8463
5684	8920	2906	6029	2948

9.	10.	11.	12.	13.
6352	3217	4328	3781	6549
4568	2864	3245	2359	5432
3682	3276	2872	4527	5326
3543	7982	0678	3209	6891
5428	4410	1522	4563	4769

	14.	15.	16.	17.
From	64758	76896	87659	97865
Take	41326	24352	34217	62322

Complete and recite the following table:

C,	100.	D,	500.	DCCCC,	900.
CC,	200.	DC,	600.	M,	1000.
CCC,	300.	DCC,	700.	MDCCC,	1800.
CCCC,	400.	DCCC,	800.	MM,	2000.
MDCCLXXVI,	1776.			MDCCCLXXXII.	1882.

LESSON III.

Subtracting when a figure in the subtrahend is larger than the one above it in the minuend.

1. In subtracting, what is the number to be diminished called?

Ans. The **Minuend.**

2. The number or part to be subtracted called?

Ans. The **Subtrahend.**

3. The result or number found by subtraction called?

Ans. The **Difference** or **Remainder.**

4. What is the difference between 453 and 135?

ANALYSIS.—Minuend 453 = 4 hunds., 4 tens, 13 units.
Subtrahend 135 = 1 hund., 3 tens, 5 units.
Difference 318 = 3 hunds, 1 ten, 8 units.

Since 5 units cannot be taken from 3 units, we take 1 ten from the 5 tens, and adding it to 3 units, we have 13 units, etc.

A shorter and better method is the following:

DIRECTIONS.—Write the less number under the greater, as in the margin. Since 4 units cannot be subtracted from 3 units, we take 1 from the 5 tens, which is equal to 10 units; and adding it to the 3 units, we have 13 units. We now take 5 units from 13 units; the remainder is 8 units, which we set in *units* place. Next, as we have taken 1 ten from the 5 tens, we have but 4 tens left; and 3 tens from 4 tens leave 1 ten, which we set in tens place. Finally, 1 hundred from 4 hundreds leaves 3 hundreds. *Ans.* 318.

$4\ \overset{4}{\not5}\ \overset{13}{\not3}$	Minuend.
1 3 5	Subtrahend.
3 1 8	Difference.

NOTE.—Taking 1 from a higher order in the minuend and adding it to a lower order is called **Borrowing Tens.**

LESSON IV.

ORAL EXERCISES.

1. John picked 4 quarts of blackberries 1 day, 3 the next, and 5 the next, he sold 7 quarts; how many had he left?

2. A storekeeper had a piece of calico containing 30 yards, and sold 8 yards to one customer, 7 to another, and 10 to another; how many yards did he have left?

3. An apple-woman having 33 apples sold 6 to one boy, 8 to another, and 9 to another; how many had she left?

WRITTEN EXERCISES.

Subtract and prove the following:

	4.	**5.**	**6.**	**7.**	**8.**	**9.**
From	532	440	675	465	608	730
Take	226	221	348	258	344	425

	10.	**11.**	**12.**	**13.**	**14.**
From	45165	53142	58730	64572	85430
Take	22638	16717	25405	38726	52700

15. From 8461875 take 3096208.

Add and read the following:

16.	**17.**	**18.**	**19.**	**20.**
6768	4360	9201	42671	62125
5020	7046	7283	68439	31684
9384	5724	4627	32074	22435
4365	8275	9874	30045	94381
8640	9342	8400	26765	25036

LESSON V.

1. The largest number that can be expressed by six figures is *999,999.*

2. Nine hundred ninety-nine thousand and **One** more is called a **Million.**

3. A million is expressed by writing 1 in the *seventh* place with six 0's on the right; thus, *1,000,000.*

4. What does each figure denote in the number 1435678 ?

Ans. The first on the right denotes 8 units, the second 7 tens, etc.

5. How write two millions? Three millions? Five millions? Seven millions? Nine millions?

6. Write in figures two millions five hundred sixty-eight thousand three hundred fifty-four.

7. One hundred twelve thousand six hundred seventy-three. Two hundred sixty thousand.

8. Three hundred forty thousand four hundred eighty-five. Five hundred eight thousand.

9. Two million five hundred sixty thousand.

10. Eight million two hundred five thousand three hundred forty-five. Five million two hundred thousand.

11. The largest number that can be expressed by seven figures is *9,999,999.*

12. Nine millions 999 thousand 999 and **One** more is called **Ten-millions,** which is expressed by writing 1 in the *eighth* place, with seven 0's on the right, and is written thus, *10,000,000.*

13. How write twenty millions? Thirty millions?

14. Write two hundred fifty-two thousand three hundred twenty-five. Eight millions fifty-two thousand.

LESSON VI.

1. The largest number that can be expressed by eight figures is *99,999,999.*

2. Ninety-nine millions 999 thousand 999 and *one* more are **One hundred millions**; which is expressed by placing 1 in the *ninth* place and eight 0's on the right, and is written thus, *100,000,000.*

3. How many figures are required to express a thousand? Ten thousand? A hundred thousand?

4. How many to express a million? Ten millions? A hundred millions?

The pupil will easily learn to write and read large numbers, by grouping the different orders of units into periods of three figures each, as seen in the following

NUMERATION TABLE.

Names of Periods.	Millions.			Thousands.			Units.		
Orders of Units.	Hund.-mill.	Ten-mill.	Millions.	Hund.-thou.	Ten-thou.	Thousands.	Hundreds.	Tens.	Units.
Number.	2	3	5 ,	2	4	0 ,	7	8	5
	3d Period.			2d Period.			1st Period.		

5. Read the number in the table.

Ans. "Two hundred thirty-five *millions,* two hundred forty *thousands,* seven hundred eighty-five."

Each period is read as if it stood alone, the *name* of the period being added. Thus, 235 is millions, 240 is thousands, and 785 is units, but the name of the last is omitted.

LESSON VII.

1. Expressing numbers by *figures* or *letters* is called **Notation.** The former is the *Arabic*, the latter the *Roman* Notation.

2. Reading numbers expressed by figures or letters is called **Numeration.**

Write in figures the following numbers:

3. Two hundred nineteen thousand, four hundred seventy-eight. Five hundred ninety thousand.

4. Twenty-five millions, three hundred sixty-one thousand, two hundred seventy-five.

5. Two hundred sixteen millions, seven hundred eighty-nine thousand, five hundred twenty-eight.

6. Ten millions, five hundred thousand, six hundred ninety-five.

7. Seventeen millions, six hundred forty-five thousand, two hundred six.

8. Forty-one millions, six hundred twenty thousand, one hundred twenty-six.

9. Twenty-two millions, six hundred thousand, one hundred forty-seven.

To Teachers.—In reading large numbers, young pupils should be required to point to each figure, beginning at the right hand, and pronounce its name or order, before they attempt to read them. Thus, "units, tens, hundreds, thousands, etc."

Write, point off into periods, and read the following:

10. 3007.	14. 40640.	18. 120400.	22. 56308.
11. 5061.	15. 6407.	19. 38026.	23. 500729.
12. 4803.	16. 509.	20. 100245.	24. 65800.
13. 6080.	17. 27025.	21. 17209.	25. 890347.

LESSON VIII.

ORAL EXERCISES.

1. A flock of 9 birds are on one branch of a tree and 7 on another; if 5 of them fly away and 2 are shot, how many will be left?

2. A boy having 21 marbles found 8 more; he gave 6 of them to his brother and lost 7; how many had he left?

3. John had 25 young doves and 8 of them died and 4 were stolen; how many were left?

4. Jay's fish-line was 25 feet long and he lost 8 feet of it; how many feet long was the remainder?

WRITTEN EXERCISES.

5. What is the sum of $6430+75+468+7+5278$?

6. What is the sum of $43819+67814+75+8432$?

Add the following:

7.	**8.**	**9.**	**10.**
142	4345	6176	83221
263	6725	4930	24332
725	4832	6875	87543
958	5163	3281	12354
142	7983	4653	34762
314	6547	7291	13579
543	8293	3824	87654
721	5421	5623	32123

	11.	**12.**	**13.**
From	485320	550713	623752
Take	165284	348632	468348

LESSON IX.

1. A wholesale merchant sold a quantity of flour for 1458 dollars, a quantity of tea for 2887 dollars, and sugar for 2689 dollars; how much did he receive for all?

2. A farmer sold 125 bushels of apples to one man. 178 bushels to another, 345 bushels to another, and 863 bushels to another; how many bushels did he sell?

3. A merchant bought muslin of one kind 225 yards, of another 328 yards, of another 234 yards, and another 846 yards; how many yards did he buy?

4. Henry traveled 256 miles by steamboat and 425 miles by rail; how much farther did he go by rail than by boat?

5. George met two droves of sheep; one contained 561, and the other 375; how many more sheep were there in one than in the other?

6.	**7.**	**8.**	**9.**
2720	5764	27856	47639
4382	5346	32534	23421
2640	3042	20631	34323
3047	5268	34327	71036
2163	3161	53102	62342
6741	2560	92763	57654
1360	7304	51834	32103
7056	2723	23452	53728
3554	8459	62327	61342
4275	6715	50632	23201

	10.	**11.**	**12.**
From	726500	6284678	8497352
Take	462126	1040640	5264781

LESSON X.

1. If I pay 236 dollars for a horse, 50 dollars for harness, and 385 dollars for a chaise, how much shall I pay for all?

2. A farmer paid 85 dollars for a yoke of oxen, 27 dollars for a cow, and 169 dollars for a horse; how much did all cost him?

3. A milk-man sold 223 quarts of milk to one customer, 179 to another, and 438 to another; how many quarts did he sell?

4. A man bought 3 farms; one contained 120 acres, another 246 acres, and the other 365 acres; how many acres did they all contain?

5. A man having 1235 sheep, lost 1163 of them; how many had he left?

6. A farmer having 1500 bushels of wheat, sold 1278 bushels; how much wheat had he left?

7. A traveler met four droves of cattle; the first contained 260, the second 175, the third 342, and the fourth 420; how many cattle did the four droves contain?

8. A carpenter built one house for 2365 dollars, another for 1648 dollars, another for 3281 dollars, and another for 5260 dollars; how much did he receive for all?

9. A man gave 1263 dollars for a lot, and 3385 dollars for building a house; how much more did his house cost than his lot?

10. If a man's annual income is 3460 dollars, and his expenses are 2340 dollars, how much does he save?

11. Find the sum of $5428 + 6032 + 746 + 9004$.

12. Find the sum of $63020 + 4856 + 5063 + 8540$.

13. Find the difference between 95463 and 246720.

LESSON XI.

ORAL EXERCISES.

1. A tradesman had a piece of calico print containing 25 yards; he took from it 2 dress patterns, one of 10 yds., the other of 8 yds.; how many yards were left?

2. Lulu and Lizzie opened a pin-wheel store; Lulu furnished 30 and Lizzie 20 pin-wheels; they sold 25; how many were left?

3. One hen had 6 chickens, another 10, another 12; how many had all? A hawk carried off 7; how many were left?

4. $6+5+8+3-4=?$ 5. $15+6+7-9=?$

WRITTEN EXERCISES.

6.	7.	8.	9.
2345	27832	13462	428594
6201	2456	4036	235
1378	35263	78193	65732
6107	287	287	2873
2340	1645	1642	164389
4165	78132	36354	6072
6014	4214	28	710582
5670	62873	6213	325
1706	287	603	16982
8143	9654	14328	873256

	10.	11.	12.	13.
From	745100	656324	826340	1000000
Take	510000	424613	513683	999999

LESSON XII.

1. George having 74 oranges, gave away 43 of them; if he should buy 35 more, how many would he then have?

2. A merchant purchased a piece of silk containing 78 yards; he then sold 18 yards to one lady, and 17 to another; how many yards had he left?

3. If a man's income is 185 dollars per month, and he pays 35 dollars for house rent, and 63 dollars per month for provisions, how much will he have for other expenses?

4. Harriet wished to read a book through which contained 726 pages, in three weeks; the first week she read 165 pages, the second week she read 264 pages; how many pages were left for her to read the third week?

5. A man bought a house for 1200 dollars, and having laid out 210 dollars for repairs, sold it for 1300 dollars; how much did he lose by the bargain?

6. A young man having 2000 dollars, spent 765 the first year and 843 the second year; how much had he left?

7. A flour dealer having 500 barrels of flour on hand, sold 263 barrels to one customer and 65 barrels to another; how many barrels had he left?

8. A man traveled 538 miles in 3 days; the first day he traveled 149 miles, the second day 126 miles; how far did he travel the third day?

9. A man paid 375 dollars for a span of horses, and 450 dollars for a carriage; he afterwards sold his horses and carriage for 1000 dollars; how much did he make?

10. A teacher whose salary was 1500 dollars a year, spent 325 dollars for board, 260 for clothing, 75 for traveling, and for other expenses 35 dollars; how much did he lay up?

LESSON XIII.

TO TEACHERS.—The object of this and the following lesson is to illustrate the idea of "*times*," as used in Multiplication and Division.

1. Make a short mark upon your slate; thus, /
2. Under this make another mark, /
3. How many times have you made one mark?

Ans. **Two times or twice.**

4. How many are 2 times one mark?
5. Make 2 marks, then 2 more on the right. //, //
6. How many times 2 marks have you now made?
7. How many are 2 times 2 marks?

Ans. **Four marks.**

8. Make 2 marks, 2 more, and 2 more. //, //, //
9. How many times 2 marks have you now made?
10. How many are 3 times 2 marks?
11. If 4 pupils give 2 apples each to their teacher, how many apples will she have?

NOTE.—Represent the apples by stars; thus,

**, **, **, **.

Ans. She will have 2 apples + 2 apples + 2 apples + 2 apples, or 4 times 2 apples, which are 8 apples.

12. Emma had 4 brothers, each of whom gave her 1 peach; how many peaches had she?

Ans. She had 1 peach + 1 peach + 1 peach + 1 peach, or 4 times 1 peach, which are 4 peaches.

Taking a number *two or more times* is called **Multiplication.**

The **Sign of Multiplication** is $\times$, and means "times."

Thus, "2×3" is read "two times three," or "2 multiplied by 3."

LESSON XIV.

1. When apples are 2 cents each, how many apples can a lad buy with 4 cents?

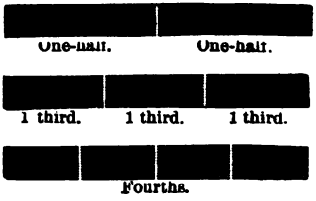
SOLUTION.—He can buy as many apples as there are times 2 cents in 4 cents; and 2 times 2 cents are 4 cents. *Ans.* 2 apples.

2. At 2 cents a spool, how many spools of cotton can you buy for 6 cents?

NOTE.—Represent the money by 6 stars. ⁂, ⁂, ⁂.

3. If pencils are 2 cents each, how many can be bought for 8 cents?

4. When a number or thing, as a strip of paper, is separated into *two* equal parts, one of these parts is called **One-half.**



5. How many halves make a unit or one?

6. When separated into *three* equal parts, one of these parts is called **One-third.**

7. How many thirds make a whole one?

8. When separated into *four* equal parts, the parts are called **Fourths.**

9. What is one-half of 2? Of 4? Of 8? Of 12?

10. What is one-third of 3? How many in 2 thirds of 3?

11. How many in 1 fourth of 4? In 3 fourths?

12. Finding *how many times* one number is contained in another, or separating a number into *equal parts*, is called **Division.**

The **Sign of Division** is ÷, and means "divided by."

Thus, 6÷2 is read "6 divided by 2."

LESSON XV.

TABLES.*

MULTIPLICATION.		DIVISION.	
$2 \times 1 = 2$	$2 \times 7 = 14$	$2 \div 2 = 1$	$14 \div 2 = 7$
$2 \times 2 = 4$	$2 \times 8 = 16$	$4 \div 2 = 2$	$16 \div 2 = 8$
$2 \times 3 = 6$	$2 \times 9 = 18$	$6 \div 2 = 3$	$18 \div 2 = 9$
$2 \times 4 = 8$	$2 \times 10 = 20$	$8 \div 2 = 4$	$20 \div 2 = 10$
$2 \times 5 = 10$	$2 \times 11 = 22$	$10 \div 2 = 5$	$22 \div 2 = 11$
$2 \times 6 = 12$	$2 \times 12 = 24$	$12 \div 2 = 6$	$24 \div 2 = 12$

1. What will 2 oranges cost at 3 cents each?

Ans. If 1 orange costs 3 cents, 2 oranges will cost 2 times 3 cents; and 2 times 3 cents are 6 cents.

2. If Susie's brother gave her 4 picture cards each day. how many did he give her in 2 days?

3. At 2 cents apiece, how many lemons can you buy for 6 cents?

Ans. If 2 cents buy 1 lemon, 6 cents will buy as many lemons as 2 cents are contained times in 6 cents, and 2 is in 6 cents 3 times. You can buy 3 lemons.

4. Frank has 8 cents; how many oranges, at 2 cents apiece, can he buy? How many 2's in 8? How many 4's?

5. How many are 2 times 5? 2 times 8? 2 times 7? 2 times 9? 2 times 11? 2 times 10? 2 times 12?

6. How many times 2 in 6? In 10? In 14? In 12? In 14? In 16? In 20? In 18? In 22? In 24?

---

* The Multiplication and Division Tables are placed side by side for the reason that the *latter* is the *opposite* of the *former*, and is naturally suggested by it. Thus, when the pupil has learned that 2 times 3 are 6, he has really learned that there are two 3's in 6.

LESSON XVI.

Copy and recite the following tables:

$3 \times 1 = 3$	$3 \times 7 = 21$	$3 \div 3 = 1$	$21 \div 3 = 7$
$3 \times 2 = 6$	$3 \times 8 = 24$	$6 \div 3 = 2$	$24 \div 3 = 8$
$3 \times 3 = 9$	$3 \times 9 = 27$	$9 \div 3 = 3$	$27 \div 3 = 9$
$3 \times 4 = 12$	$3 \times 10 = 30$	$12 \div 3 = 4$	$30 \div 3 = 10$
$3 \times 5 = 15$	$3 \times 11 = 33$	$15 \div 3 = 5$	$33 \div 3 = 11$
$3 \times 6 = 18$	$3 \times 12 = 36$	$18 \div 3 = 6$	$36 \div 3 = 12$

1. Frank had 3 hens, which had 4 chickens each; how many chickens had he?

2. If there are 6 cherries in a bunch, how many cherries are there in 3 bunches? How many 3's in 6?

3. When a number is divided into 2 equal parts, what are the parts called?

4. What is 1 half of 4 oranges? Of 6 oranges? Of 8?

5. In one week are 7 days; how many days in 3 weeks?

6. How many are 3×7? How many are 7×3?

7. How many 1's in 1 half of 4? Of 6? Of 8? Of 10?

8. What is 1 third of 3? 2 thirds of 3? 3 thirds?

9. What is 1 third of 9? Of 12? Of 18? Of 27?

10. A teacher divided 12 filberts equally among 3 little girls; what part and how many did each have?

Copy and write the answers to the following:

11. $4 \times 3 = ?$ $8 \times 3 = ?$ $9 \times 3 = ?$ $10 \times 2 = ?$ $6 \times 3 = ?$
$7 \times 3 = ?$ $11 \times 3 = ?$ $12 \times 3 = ?$ $5 \times 3 = ?$ $12 \times 2 = ?$

12. $15 \div 2 = ?$ $27 \div 4 = ?$ $18 \div 3 = ?$ $36 \div 3 = ?$ $33 \div 3 = ?$
$12 \div 3 = ?$ $24 \div 3 = ?$ $30 \div 3 = ?$ $21 \div 3 = ?$ $24 \div 2 = ?$

LESSON XVII.

Copy and recite the following tables:

$4 \times 1 = 4$	$4 \times 7 = 28$	$4 \div 4 = 1$	$28 \div 4 = 7$
$4 \times 2 = 8$	$4 \times 8 = 32$	$8 \div 4 = 2$	$32 \div 4 = 8$
$4 \times 3 = 12$	$4 \times 9 = 36$	$12 \div 4 = 3$	$36 \div 4 = 9$
$4 \times 4 = 16$	$4 \times 10 = 40$	$16 \div 4 = 4$	$40 \div 4 = 10$
$4 \times 5 = 20$	$4 \times 11 = 44$	$20 \div 4 = 5$	$44 \div 4 = 11$
$4 \times 6 = 24$	$4 \times 12 = 48$	$24 \div 4 = 6$	$48 \div 4 = 12$

1. Fred. picked 2 quarts of strawberries each day for 4 days; how many quarts did he pick in all?

2. Four pupils brought the teacher 3 apples each; how many apples had she in all? What part of the apples did each bring?

3. Frank divided 12 chestnuts into 4 equal parts; how many and what part of the chestnuts were in each?

4. How many are 4 two's? How many 4's in 12?

5. What will 4 postage stamps cost at 3 cents each?

6. How many 3's in 12? How many times 6 make 12?

7. Harry's mother gave him 16 peaches to divide equally among his 4 sisters; how many could he give to each?

8. A father divided 18 pears equally among his 3 children; how many did he give to each? How many 3's in 18?

9. What is 1 half of 4? 1 fourth of 4? 3 fourths?

Copy and write the answers to the following.

10. $9 \times 4 = ?$ 12. $11 \times 4 = ?$ 14. $10 \times 4 = ?$
11. $24 \div 4 = ?$ 13. $48 \div 4 = ?$ 15. $28 \div 4 = ?$

LESSON XVIII.

Copy and recite the following tables :

$5 \times 1 = 5$	$5 \times 7 = 35$	$5 \div 5 = 1$	$35 \div 5 = 7$
$5 \times 2 = 10$	$5 \times 8 = 40$	$10 \div 5 = 2$	$40 \div 5 = 8$
$5 \times 3 = 15$	$5 \times 9 = 45$	$15 \div 5 = 3$	$45 \div 5 = 9$
$5 \times 4 = 20$	$5 \times 10 = 50$	$20 \div 5 = 4$	$50 \div 5 = 10$
$5 \times 5 = 25$	$5 \times 11 = 55$	$25 \div 5 = 5$	$55 \div 5 = 11$
$5 \times 6 = 30$	$5 \times 12 = 60$	$30 \div 5 = 6$	$60 \div 5 = 12$

1. If Arthur picks 6 quarts of blackberries in a day, how many will he pick in 5 days? $5 \times 7 = ?$

2. If you put 20 blocks into 5 equal piles, how many blocks and what part will be in each pile?

3. When a number is divided into 5 equal parts, what are the parts called?

4. If 30 quarts of berries are divided into 5 equal parts, how many quarts will there be in each part?

5. How many times 5 in 30? How many 6's?

6. What part of 5 is 1? Is 2? Is 4? Is 3?

7. How many 2-cent stamps can you buy for 30 cents?

8. How many in 1 fifth of 5? 2 fifths of five are how many? 3 fifths of 5? 4 fifths of 5? 5 fifths of 5?

Copy and write the answers to the following :

9. $6 \times 5 = ?$	13. $7 \times 5 = ?$	17. $5 \times 5 = ?$
10. $25 \div 5 = ?$	14. $40 \div 5 = ?$	18. $60 \div 5 = ?$
11. $8 \times 5 = ?$	15. $9 \times 5 = ?$	19. $5 \times 5 = ?$
12. $30 \div 5 = ?$	16. $35 \div 5 = ?$	20. $55 \div 5 = ?$

21. Add $23682 + 2836 + 46573 + 468 + 43684$.

22. Add $34573 + 39542 + 58754 + 8705 + 92738$.

LESSON XIX.

Copy and recite the following tables:

$6 \times 1 = 6$	$6 \times 7 = 42$	$6 \div 6 = 1$	$42 \div 6 = 7$
$6 \times 2 = 12$	$6 \times 8 = 48$	$12 \div 6 = 2$	$48 \div 6 = 8$
$6 \times 3 = 18$	$6 \times 9 = 54$	$18 \div 6 = 3$	$54 \div 6 = 9$
$6 \times 4 = 24$	$6 \times 10 = 60$	$24 \div 6 = 4$	$60 \div 6 = 10$
$6 \times 5 = 30$	$6 \times 11 = 66$	$30 \div 6 = 5$	$66 \div 6 = 11$
$6 \times 6 = 36$	$6 \times 12 = 72$	$36 \div 6 = 6$	$72 \div 6 = 12$

1. If a man sells 6 canary-birds at 2 dollars apiece, what will he get for them all?

2. If you divide 32 oranges equally among 4 boys, how many will each have?

3. When you divide a number or thing into *six* equal parts, what are the parts called?

4. If you divide 18 bananas into 6 equal parts, how many and what part will there be in each?

5. What is a fifth of 15? Of 30? Of 45? of 60?

6. A farmer divided 42 peaches among 6 boys; how many and what part did each boy receive?

Copy and write the answers to the following:

7. $6 \times 4 = ?$	12. $66 \div 6 = ?$	17. $10 \times 6 = ?$
8. $12 \div 6 = ?$	13. $8 \times 6 = ?$	18. $54 \div 6 = ?$
9. $7 \times 6 = ?$	14. $48 \div 6 = ?$	19. $12 \times 6 = ?$
10. $24 \div 6 = ?$	15. $11 \times 6 = ?$	20. $72 \div 6 = ?$
11. $9 \times 6 = ?$	16. $42 \div 6 = ?$	21. $6 \times 6 = ?$

22. From	832560	725643	689723
Take	628439	433850	689723

LESSON XX.

Examples uniting Addition and Subtraction.

1. A miller bought 200 bushels of wheat of one farmer, and 153 of another; he afterwards sold 189 bushels; how many bushels did he have left?

2. A man traveled 538 miles in 3 days; the first day he traveled 149 miles, the second day 126 miles; how far did he travel the third day?

3. A grocer bought a cask of oil containing 256 gallons; after selling 93 gallons, he perceived the cask was leaky, and on measuring what was left, found he had 38 gallons; how many gallons had leaked out?

4. A manufacturer bought 248 pounds of wool of one customer, and 361 of another; he then worked up 430 pounds; how many pounds had he left?

5. A man paid 375 dollars for a span of horses, and 450 dollars for a carriage; he sold his horses and carriage for 1000 dollars; how much did he make by his bargain?

6. A grocer bought 285 pounds of lard of one farmer, and 327 pounds of another; he afterwards sold 110 pounds to one customer, and 163 pounds to another; how much lard did he have left?

7. A miller having 1500 barrels of flour on hand, sold 563 barrels to one customer and 265 barrels to another; how many barrels had he left?

8. Add $3478+58636+636726+648-35684$?

9. Add $73463+278+964850-53206+500403$.

10. Find the difference between 8672594 and 3278693.

11. (See Appendix, p. 139.)

TABLES.—Continued.

LESSON I.

$7 \times 1 = 7$	$7 \times 7 = 49$	$7 \div 7 = 1$	$49 \div 7 = 7$
$7 \times 2 = 14$	$7 \times 8 = 56$	$14 \div 7 = 2$	$56 \div 7 = 8$
$7 \times 3 = 21$	$7 \times 9 = 63$	$21 \div 7 = 3$	$63 \div 7 = 9$
$7 \times 4 = 28$	$7 \times 10 = 70$	$28 \div 7 = 4$	$70 \div 7 = 10$
$7 \times 5 = 35$	$7 \times 11 = 77$	$35 \div 7 = 5$	$77 \div 7 = 11$
$7 \times 6 = 42$	$7 \times 12 = 84$	$42 \div 7 = 6$	$84 \div 7 = 12$

1. If a quart of raspberries cost 7 cents, what will 3 quarts cost? 5 quarts? 7 quarts? 6 quarts? 8 quarts?

2. Four little girls opened a pin-wheel store; if each put in 7, how many pin-wheels would they have?

3. Harry sold cherries at 7 cents a quart and received 21 cents; how many quarts did he sell?

4. How many quarts must he sell at 3 cents a quart to get 21 cents?

5. There are 7 days in 1 week; how many days are there in 6 weeks? In 8 weeks? In 10 weeks? In 12 weeks?

6. What part of a week is 1 day? 2 days? 4 days? 6 days?

7. How many weeks are there in 21 days? In 35 days? In 63 days? In 42 days? In 56 days? In 49 days?

LESSON II.

Copy and recite the following tables:

$8 \times 1 = 8$	$8 \times 7 = 56$	$8 \div 8 = 1$	$56 \div 8 = 7$
$8 \times 2 = 16$	$8 \times 8 = 64$	$16 \div 8 = 2$	$64 \div 8 = 8$
$8 \times 3 = 24$	$8 \times 9 = 72$	$24 \div 8 = 3$	$72 \div 8 = 9$
$8 \times 4 = 32$	$8 \times 10 = 80$	$32 \div 8 = 4$	$80 \div 8 = 10$
$8 \times 5 = 40$	$8 \times 11 = 88$	$40 \div 8 = 5$	$88 \div 8 = 11$
$8 \times 6 = 48$	$8 \times 12 = 96$	$48 \div 8 = 6$	$96 \div 8 = 12$

1. In 1 quart there are 2 pints; how many pints are there in 8 quarts? In 7 quarts? In 6 quarts?

2. How many quarts are there in 8 pints? In 6 pints? In 12 pints? In 16 pints?

3. There are 3 feet in 1 yard; how many feet are there in 8 yards? 9 yards? 12 yards?

4. At 8 cents a yard, what will 5 yards of calico cost? 7 yards? 8 yards?

5. At 8 cents a yard, how many yards of muslin can you buy for 16 cents? For 32 cents? For 64 cents?

6. What part of 2 is 1? What part of 3 is 1?

7. How many yards in one-half of 4 yards? Of 8 yards? Of 12 yards? Of 20 yards?

8. How many yards in one-third of 9 yards? In 2 thirds?

9. How many yards in 1 fourth of 12 yards? In 2 fourths? In 3 fourths?

Copy and write the answers to the following:

10. $5 \times 8 = ?$	13. $6 \times 8 = ?$	16. $9 \times 8 = ?$
11. $24 \div 3 = ?$	14. $40 \div 5 = ?$	17. $56 \div 7 = ?$
12. $7 \times 8 = ?$	15. $8 \times 8 = ?$	18. $11 \times 8 = ?$

LESSON III.

Copy and recite the following tables:

$9 \times 1 = 9$	$9 \times 7 = 63$	$9 \div 9 = 1$	$63 \div 9 = 7$
$9 \times 2 = 18$	$9 \times 8 = 72$	$18 \div 9 = 2$	$72 \div 9 = 8$
$9 \times 3 = 27$	$9 \times 9 = 81$	$27 \div 9 = 3$	$81 \div 9 = 9$
$9 \times 4 = 36$	$9 \times 10 = 90$	$36 \div 9 = 4$	$90 \div 9 = 10$
$9 \times 5 = 45$	$9 \times 11 = 99$	$45 \div 9 = 5$	$99 \div 9 = 11$
$9 \times 6 = 54$	$9 \times 12 = 108$	$54 \div 9 = 6$	$108 \div 9 = 12$

1. Eddie had 18 books, and put 9 in a pile; how many piles did he make? How many are 9 times 2?

2. If he puts 6 books in a pile, how many piles can he make? If he puts 3 in a pile, how many?

3. What is 1 half of 18? 1 third? 1 sixth?

4. If you buy 1 slate for 9 cents, how many slates can you buy for 36 cents? For 27 cents? For 54 cents?

5. John has seed enough to plant 45 hills of corn in his garden; how many rows will he have if he puts 9 hills in a row? How many rows if he puts 5 hills in a row?

Copy and complete the following at sight:

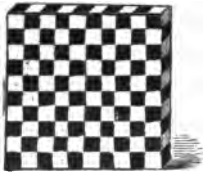
6. $9 \times 6 = ?$	12. $5 \times 9 = ?$	18. $8 \times 9 = ?$
7. $27 \div 3 = ?$	13. $36 \div 9 = ?$	19. $63 \div 9 = ?$
8. $8 \times 6 = ?$	14. $9 \times 4 = ?$	20. $7 \times 8 = ?$
9. $28 \div 7 = ?$	15. $49 \div 7 = ?$	21. $72 \div 9 = ?$
10. $6 \times 7 = ?$	16. $9 \times 3 = ?$	22. $6 \times 9 = ?$
11. $42 \div 6 = ?$	17. $54 \div 6 = ?$	23. $63 \div 7 = ?$

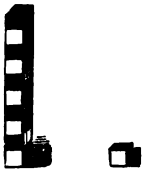
24. Add $328563 + 5086 + 273 + 528684 + 28973 + 578634 + 27352 + 3084 + 27 + 536879$.

LESSON IV.

Copy and recite the following tables:

$10 \times 1 = 10$	$10 \times 7 = 70$	$10 \div 10 = 1$	$70 \div 10 = 7$
$10 \times 2 = 20$	$10 \times 8 = 80$	$20 \div 10 = 2$	$80 \div 10 = 8$
$10 \times 3 = 30$	$10 \times 9 = 90$	$30 \div 10 = 3$	$90 \div 10 = 9$
$10 \times 4 = 40$	$10 \times 10 = 100$	$40 \div 10 = 4$	$100 \div 10 = 10$
$10 \times 5 = 50$	$10 \times 11 = 110$	$50 \div 10 = 5$	$110 \div 10 = 11$
$10 \times 6 = 60$	$10 \times 12 = 120$	$60 \div 10 = 6$	$120 \div 10 = 12$





1. Ten times 1 block are how many blocks?
2. What part of 10 blocks is 1 block? 3 blocks? 5 blocks? 6 blocks? 8 blocks? 9 blocks?
3. How many are 10 times 10 blocks?
4. How many times 10 blocks in 100 blocks?
5. What part of 100 blocks is 10 blocks?
6. What will 10 quarts of milk cost at 6 cents a quart?
7. If you pay 10 cents a pound for maple sugar, how many pounds can you buy for 80 cents?

Read the following numbers and find their sum:

8. 25632; 33473; 328654; 702395; 483576.
9. 482658; 596007; 4305728; 5278306; 5967348.
10. 75350478; 82648502; 95876458; 86397594.

LESSON V.

Copy and recite the following tables:

$11 \times 1 = 11$	$11 \times 7 = 77$	$11 \div 11 = 1$	$77 \div 11 = 7$
$11 \times 2 = 22$	$11 \times 8 = 88$	$22 \div 11 = 2$	$88 \div 11 = 8$
$11 \times 3 = 33$	$11 \times 9 = 99$	$33 \div 11 = 3$	$99 \div 11 = 9$
$11 \times 4 = 44$	$11 \times 10 = 110$	$44 \div 11 = 4$	$110 \div 11 = 10$
$11 \times 5 = 55$	$11 \times 11 = 121$	$55 \div 11 = 5$	$121 \div 11 = 11$
$11 \times 6 = 66$	$11 \times 12 = 132$	$66 \div 11 = 6$	$132 \div 11 = 12$

1. If it takes 11 yards of cashmere to make Kate a dress, how many dresses can she make from 33 yards?

2. At 10 cents a yard, what cost 11 yards of calico?

3. If 11 quarts of blackberries cost 88 cents, what is that a quart? What would 5 quarts cost at the same price?

4. Henry had 15 doves and 4 of them were stolen; he sold the remainder at 10 cents apiece; what did they come to?

5. Robert is 11 years old and his father is 5 times his age; how old is his father? How many 11's are in 55?

6. What part of 11 is 1? What part is 2? Is 5? Is 7?

Copy the following and write the answers:

7. $5 \times 8 = ?$	11. $8 \times 3 = ?$	15. $4 \times 9 = ?$
8. $6 \times 3 = ?$	12. $5 \times 6 = ?$	16. $6 \times 7 = ?$
9. $7 \times 8 = ?$	13. $6 \times 3 = ?$	17. $8 \times 10 = ?$
10. $8 \times 11 = ?$	14. $4 \times 10 = ?$	18. $4 \times 11 = ?$

Express in figures the following numbers:

19. Five hundred forty millions, three thousand ten.

20. Seven millions, fourteen thousand twenty-nine.

21. Eighteen hundred millions, three thousand seven.

LESSON VI.

Copy and recite the following tables:

$12 \times 1 = 12$	$12 \times 7 = 84$	$12 \div 12 = 1$	$84 \div 12 = 7$
$12 \times 2 = 24$	$12 \times 8 = 96$	$24 \div 12 = 2$	$96 \div 12 = 8$
$12 \times 3 = 36$	$12 \times 9 = 108$	$36 \div 12 = 3$	$108 \div 12 = 9$
$12 \times 4 = 48$	$12 \times 10 = 120$	$48 \div 12 = 4$	$120 \div 12 = 10$
$12 \times 5 = 60$	$12 \times 11 = 132$	$60 \div 12 = 5$	$132 \div 12 = 11$
$12 \times 6 = 72$	$12 \times 12 = 144$	$72 \div 12 = 6$	$144 \div 12 = 12$

1. An orchard has 12 rows of trees and 7 trees in a row; how many trees are there in the orchard?

2. A florist made 11 bouquets which had 5 flowers each; how many flowers did he use? How many are 11 times 5?

3. If he sells his bouquets at 8 cents apiece, how much will they come to? How many are 11 times 6?

4. How many oranges, at 6 cents, can you buy for 60 cents?

Copy the following and write the answers at sight:

5. $6 \times 9 = ?$	13. $8 \times 6 = ?$	21. $12 \times 7 = ?$
6. $63 \div 7 = ?$	14. $72 \div 8 = ?$	22. $99 \div 11 = ?$
7. $7 \times 8 = ?$	15. $4 \times 9 = ?$	23. $11 \times 11 = ?$
8. $72 \div 9 = ?$	16. $54 \div 6 = ?$	24. $108 \div 9 = ?$
9. $6 \times 7 = ?$	17. $4 \times 7 = ?$	25. $9 \times 12 = ?$
10. $84 \div 7 = ?$	18. $96 \div 12 = ?$	26. $121 \div 11 = ?$
11. $9 \times 7 = ?$	19. $8 \times 9 = ?$	27. $11 \times 12 = ?$
12. $96 \div 8 = ?$	20. $54 \div 9 = ?$	28. $132 \div 12 = ?$

29. Write units under units, tens under tens, and find the sum of 75; 230; 4506; 27; 14280; 10183; 216021; 405; 5483; 84533; 642357; 8007.

MULTIPLICATION.

LESSON VII.

1. Taking a number as many times as there are units in another number is called **Multiplication.**

2. The number multiplied is called the **Multiplicand.**

3. The number to multiply by is called the **Multiplier,** and shows how many times the multiplicand is to be taken.

4. The *result* or answer found by multiplication is called the **Product.**

5. The **Sign of Multiplication** is $\times$, and means "times" or "multiplied by." Thus,

$7 \times 6 = 42$, is read "7 times 6" or "7 multiplied by 6 equal 42."

6. The multiplier and multiplicand are called **Factors.**

When no Single Product is more than Nine.

1. Multiply 324 by 2.

324	Multiplicand.
2	Multiplier.
648	Product.

EXPLANATION.—We write the numbers as in the margin, and beginning at the right proceed thus: 2 times 4 units are 8 units; set the 8 in units place; 2 times 2 tens are 4 tens; set the 4 in tens place; 2 times 3 hundreds are 6 hundreds; set the 6 in hundreds place. *Ans.* 648.

Multiply	2113	1321	21212	22102	21022
By	2	3	4	4	4

LESSON VIII.

When a Single Product is more than *Nine*.

1. How many are 4 times 36 ?

EXPLANATION.—We write the numbers as in the margin, the multiplier under the multiplicand, and proceed thus: 4 times 6 units are 24 units, or 2 tens and 4 units. We write the 4 in units place and reserve the tens to add to the product of tens. 4 times 3 tens are 12 tens, and 2 added make 14 tens, or 1 hundred and 4 tens, which we write in tens and hundreds places.

36	Multiplicand.
4	Multiplier.
144	Product.

2. What is the product of 856 multiplied by 3 ?

EXPLANATION.—Multiplying each figure of the multiplicand by the multiplier, as before, the product is 2568.

Multiply the following in like manner :

3.	**4.**	**5.**	**6.**	**7.**
584	675	742	823	943
4	5	7	6	8
8.	**9.**	**10.**	**11.**	**12.**
526	632	345	1225	8260
5	8	6	7	9

13. What will 275 barrels of flour cost, at 8 dollars per barrel ?

14. What cost 347 ploughs, at 9 dollars apiece ?

15. A man bought 463 pair of boots, at 7 dollars a pair ; how much did he pay for the whole ?

16. What cost 296 acres of land, at 8 dollars per acre ?

17. What cost 6 pianos at 650 dollars apiece ?

When the Multiplier contains Two or More Figures.

1. Multiply 38 by 24.

EXPLANATION.—We multiply the multiplicand by each figure of the multiplier.	38	Multiplicand.
	24	Multiplier.
The product of the multiplicand 38 by 4 ones	= 152	Prod. by 4.
The product of 38 by 2 tens or 20	= 76	Prod. by 20.
Adding these products, the entire product	= 912	*Ans.*

NOTE.—1. The products by the separate figures of the multiplier are called **Partial Products.**

	2.	**3.**	**4.**	**5.**	**6.**
Multiply	27	38	243	356	467
By	15	21	25	32	35

7. Multiply 173 by 36.
8. Multiply 284 by 52.
9. Multiply 293 by 45.
10. Multiply 398 by 56.

NOTE.—2. The pupil must be careful to place the *first figure* of each partial product under the *figure* by which he is multiplying; then add these *partial* products together for the *entire* product.

11. At 38 dollars apiece, what cost 27 cows?

12. A merchant sold 185 barrels of pork at 22 dollars a barrel; what did he get for the pork?

13. What cost 256 acres of land at 27 dollars an acre?

14. A steamer sails 248 miles a day; how far will it go in 24 days?

	15.	**16.**	**17.**	**18.**
Multiply	2125	8275	28142	53468
By	23	30	21	25

DIVISION.

LESSON IX.

1. Finding how many times one number is contained in another, or separating a number into equal parts, is called **Division.**

2. The number divided is called the **Dividend.**

3. The number to divide by is called the **Divisor.**

4. The *result* or *answer* found is called the **Quotient.**

5. The part of the dividend *left* after dividing is called the **Remainder,** and is always *less* than the divisor.

6. The **Sign of Division** is ÷ and means "divided by."

Thus, 36÷4 = 9 is read "36 divided by 4 equals 9."

When each figure of the Dividend contains the Divisor without a Remainder.

7. Divide 648 by 2.

EXPLANATION.—We write the divisor on the left of the dividend, with a curved line between them, and proceed thus: 2 is contained in 6, 3 times. Set the 3 under the 6, or figure divided. 2 is in 4, 2 times; set the 2 under the 4; 2 is in 8, 4 times; set the 4 under the 8. The answer is 324.

Div. 2) 648 Divid.
Ans. 324 Quot.

Divide the following in like manner:

8.	9.	10.	11.	12.
2) 3364	3) 6339	4) 69968	5) 39965	6) 36996

When Remainders occur in Dividing.

1. Divide 725 by 3.

FIRST METHOD.

The divisor 3, is contained in 7, 2 times and 1 over. We write the 2 under the figure divided and prefix the 1 remainder to the next figure of the dividend, making 12; now 3 is in 12, 4 times. Write the 4 for the next figure of the quotient. Again, 3 is in 5 once and 2 over; write 1 in the quotient, and place the remainder 2 at the right. The quotient is 241 and 2 remainder.

Div. 3) 725 Divid.
Quot. 241, 2 Rem.

SECOND METHOD.

First.—We find 3 is in 7 twice, and place the 2 in the quotient on the right of the dividend.

Second.—We multiply the divisor by 2, and set the product 6 under 7, the part divided.

Third.—Subtracting 6 from 7, the rem. is 1.

Fourth.—To the right of this remainder bring down the next figure of the dividend, making 12, and divide as before. The answer is 241 and 2 remainder.

Div.	Divid.	Quot.
3)	725	(241
	6	
	12	
	12	
	05	
	3.	
	2, Rem.	

PROOF.—Multiply the *quotient* by the *divisor*, to the *product* add the *remainder*, if any, and if the result is equal to the *dividend*, the work is right. Thus, $(241 \times 3) + 2 = 725$.

NOTE.—The first method of dividing is called **Short Division.** The second method is called **Long Division.**

Divide the following by both methods and prove the work:

2.	**3.**	**4.**	**5.**	**6.**
2) 1152	3) 1521	3) 4012	4) 2240	4) 6270
7.	**8.**	**9.**	**10.**	**11.**
5) 6842	5) 4021	6) 8326	5) 8752	6) 5238

LESSON X.

ORAL EXERCISES.

1. At 6 cents each, how many bananas can you buy for 42 cents?

2. Edith divided 36 plums equally among 6 companions; how many and what part did she give to each?

3. What is one-half of 36? One-third? One-fourth?

4. If you have 60 cents, how many 5-cent stamps can you buy? How many 3-cent stamps? 2-cent? 10-cent?

WRITTEN EXERCISES.

1. How many times is 5 contained in 1523?

EXPLANATION.—Since 5 is not contained in 1, we find how many times it is contained in 15, and set the quotient 3 under the 5. 5 is in 2, 0 times and 2 remainder. 5 is in 23, 4 times and 3 remainder. The *Ans.* is 304 and 3 remainder.

Div. 5) 1523 Divid.
Quot. 304, 3 Rem.

Divide by both methods and prove each of the following:

2.	3.	4.	5.
4) 3572	6) 8034	7) 8795	8) 9895
6.	**7.**	**8.**	**9.**
7) 82064	6) 37545	8) 41673	9) 53289

10. A lot of 8 pictures were sold at an auction for $1496, what was that apiece?

11. How many times 9 in 6 times 144?

12. At $12 apiece, how many bureaus can be bought for $1716?

LESSON XI.

ORAL EXERCISES.

1. At $4 apiece, how many hats can you buy for $64, and what will remain?

2. What cost 12 baskets of strawberries at 8 cts. a basket?

3. How many times 7 in 5 times 8, and how many over?

4. How many times 8 in 9 times 7, and how many over?

5. If 6 yards of muslin make a child's dress, how many dresses can be made from 45 yards, and how much over?

6. Ada had 50 bulbs which she planted 6 in a row; how many rows did she have, and how many bulbs remained?

WRITTEN EXERCISES.

1. Multiply 7504 by 8.

SOLUTION.—In this example the product of the tens is nothing. But we have 3 to carry from the product of units, which we put in tens place and proceed as before.

7504	Multiplicand.
8	Multiplier.
60032	Product.

2. A merchant sold 864 barrels of beef at 18 dollars a barrel; how much did he get for it?

3. If a builder gets $3455 apiece, how much will he have for a row of 25 houses?

4. How many sheep, at 6 dollars apiece, can be bought for 3912 dollars? How many for 4500 dollars?

5. How many acres of land, at 9 dollars per acre, can be bought for 4169 dollars, and how much remainder?

6.	**7.**	**8.**
$8264 \div 7 = ?$	$37545 \div 8 = ?$	$12673 \div 9 = ?$
$3526 \times 23 = ?$	$2632 \times 26 = ?$	$4345 \times 27 = ?$

United States Money.

LESSON XII.

TABLE.

10 mills (*m.*)	are	1 cent,		*ct.*
10 cents	"	1 dime,		*d.*
10 dimes	"	1 dollar,		*doll.*
10 dollars	"	1 eagle,		*E.*

1. How many cents in 3 dimes? In 5 dimes? 8 dimes?
2. How many cents in 2 dollars? 3 doll.? 5 doll.?
3. How many dimes in 30 cents? In 50 cents?
4. How many dollars in 200 cents? In 300 cents?
5. The Dollar Sign is $; it is placed before the given number of dollars.

Thus, $25 is read "twenty-five dollars."

1. Dollars and cents are written together by *placing a period* (.) between them, and the *dollar mark* ($) on the left of dollars. Thus, 5 dollars 25 cents are written $5.25.

2. Cents are written alone by placing the period after the sign $, and before the cents. Thus, 25 cents are written $.25.

3. When the number of cents is less than 10, a cipher must be placed before them. Thus, 6 ct. are written $.06.

4. Mills are written on the right of cents.

Thus, 6 dollars 23 cents 5 mills are written $6.235.

5. How many ct. in a half dime? 2 dimes and a half?

6. How many ct. in a half dollar? A quarter dollar?

7. Write in figures six dollars forty-three cents.

8. Twenty-eight dollars sixty-three cents.

9. Seventy-five dollars fifty-seven cents five mills.

10. Two hundred thirty-four dollars eighty-seven cents.

11. Read the following: $2.38; $256; $64.20; $28.405; $5.23; $5.06; $82.05; $39.084; $6.50; $.845; $93.60.

12. If you pay 3 dimes for an Arithmetic and 2 dimes for a slate, how many cents do you pay for both?

13. A man having $25, spent $7 of it; how many dollars had he left?

14. Fred. had a half dollar to spend on a holiday; he bought a lunch for a dime, some oranges for 2 dimes, and spent a half-dime for car-fare; how much money did he have left?

15. A young man paid $15 for a coat, $8 for pants, and $2.25 for gloves; how much did he pay for all?

16. The price of a pair of shoes is $6.75, of gloves $2.25, a hat $9.87; how much would all come to?

LESSON XIII.

1. What is the sum of \$34, 62 cts., 6 mills; \$23, 15 cts.; and \$48, 75 cts., 9 mills?

EXPLANATION.—We write the numbers as in the margin, placing dollars under dollars, etc., and add them as we add other numbers, placing the period under the column of periods.

\$34.626
23.15
48.759
\$106.535, *Ans.*

2. Add \$13, 25 ct.; \$24, 12 ct., 5 m.; and \$34, 17 ct., 8 m.

NOTE.—In adding and subtracting U. S. Money, care must be taken to place dollars under dollars, cents under cents, and mills under mills.

3.	4.	5.	6.	7.
\$35.72	\$22.31	\$37.21	\$52.24	\$64.075
27.43	45.34	24.73	71.23	73.35
54 61	73.06	38.42	28.54	48.273
38.45	82.53	72.16	71.20	52.095
63.40	27.65	65.70	45.36	63.70

8. Henry's new suit cost \$18.50, his hat \$3.25, and his shoes \$4.75; what did his whole outfit come to?

9. Find the difference between \$248.538 and \$134.473.

EXPLANATION.—We write the less number under the greater, dollars under dollars, etc., and subtract, placing the period in the answer under the other periods.

\$248.538 Min.
\$134.473 Sub.
Ans. \$114.065 Dif.

	10.	11.	12.	13.
From	\$375.25	\$428.23	\$564.07	\$800.358
Take	253.75	234.21	372.60	520.205

LESSON XIV.

ORAL EXERCISES.

1. A farmer sold 6 cows at $20 apiece; what did he receive for them?

2. A baker bought 30 barrels of flour at $7 a barrel; what did he pay for the whole?

3. If 1 yard of broadcloth cost $5, what will 60 yards cost? 80 yards?

4. A man paid $3 a head for 100 sheep, and sold them for $4 a head; how much was his profit?

5. A man bought 7 horses at $200 apiece, and sold them all for $1200; how much did he lose by the operation?

WRITTEN EXERCISES.

6. Multiply $365.483 by 5.

EXPLANATION.—We multiply as in other numbers (p. 92). In the product we point off as many figures for cents and mills as there are places of cents and mills in the multiplicand.

$365.483	Multiplicand.
5	Multiplier.
$1827.405	Product.

	7.	8.	9.	10.
Multiply	$543.05	$658.23	$876.78	$89.875
By	4	6	7	8

11. A manufacturer sold 6 pianos at $750 each; what did he receive for them?

12. A builder bought 7 house-lots at $1275 apiece; what did he pay for all of them?

13. If a teacher's salary is $2750 a year, what would it amount to in 10 years?

LESSON XV.

Liquid Measure.

Liquid Measure is used is measuring milk, oil, molasses, etc.

TABLE.

4	gills (*gi.*)	=	1 pint,	*pt.*
2	pints, or 8 gills	=	1 quart,	*qt.*
4	quarts	=	1 gallon,	*gal.*
31½	gallons	=	1 barrel,	*bbl.* or *bar.*
63	gallons, or 2 bbl.,	=	1 hogshead,	*hhd.*

1. How many gills in 2 pints? In 6 pints? In 4 pints?
2. How many pints in 3 quarts? In 8 quarts?
3. How many quarts in 3 gallons? In 4 gallons?
4. How many quarts in 5 gallons and 2 quarts?
5. In 16 quarts, how many gallons?
6. In 8 pints, how many quarts? In 12 pints?
7. How many quarts in 12 pints? In 20 pints?
8. In 16 gills, how many pints? In 20 gills?
9. How many quarts in 6 gallons and 3 quarts?
10. How many gallons in 65 quarts, and how many quarts over?
11. How many quarts in 84 gills?

WRITTEN EXERCISES

1. How many quarts in 286 gallons?

EXPLANATION.—Since in 4 quarts there is 1 gallon, in 286 gallons there are 4 times as many quarts as gallons; and 4 times 286 = 1144 quarts, *Ans.*

286
4
Ans. 1144 qt.

2. How many gills in 375 quarts?
3. How many gallons in 256 hogsheads?
4. How many quarts in 256 gills?

EXPLANATION.—Since 8 gills make 1 quart, 256 gills make as many quarts as 8 is contained times in 256; and 256÷8 = 32 quarts, *Ans.*

8)256
Ans. 32 qt.

5. How many pints in 584 gills? In 868 gills?
6. How many gallons in 1000 quarts?
7. How many gallons in 215 quarts, and how many quarts over? In 347 quarts?
8. How many quarts in 243 gallons and 3 quarts?
9. How many gallons in 125 hogsheads and 15 gallons?
10. At 9 cents a quart, what cost 256 quarts of vinegar?
11. What cost 144 gallons of milk at 20 cents a gallon?
12. If a cistern contains 156 gallons of water, how many gallons will 25 cisterns contain?

	13.	**14.**	**15.**	**16.**	**17.**
Multiply	563 pt.	645 qt.	849 gal.	956 bbl.	897 hhd,
By	26	28	36	43	56

18.	**19.**	**20.**
4839÷5 = ?	54923÷4 = ?	67894÷9 = ?

21.	**22.**	**23.**
2356÷6 = ?	38520÷7 = ?	45654÷8 = ?

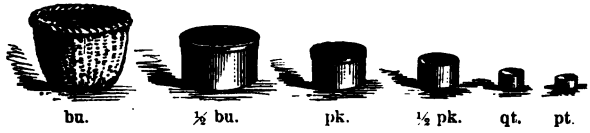
LESSON XVI.

Dry Measure.

Dry Measure is used in measuring grain, vegetables, fruit, etc.

TABLE.

2 pints (*pt.*)	=	1 quart,	*qt.*
8 quarts	=	1 peck,	*pk.*
4 pecks, or 32 qts.,	=	1 bushel,	*bu.*



1. How many times must you fill a pint measure to make a quart?
2. How many pints in 3 quarts? In 5 quarts?
3. How many times must you fill a quart measure to make a peck?
4. How many quarts in 3 pecks? In 4 pecks?
5. George picked 3 pecks of chestnuts and sold them by the quart; how many quarts did he sell?
6. If he had picked 16 quarts, how many pecks would he have had?
7. How many quarts in 16 pints? How many pecks?
8. How many bushels in 24 pecks?
9. How many pecks in 40 quarts?
10. How many bushels in 40 pecks?
11. What does a quart of pop-corn cost at 4 cts. a pint?

LESSON XVII.

ORAL EXERCISES.

1. A grocer bought 3 bushels of tomatoes and sold them at 25 cents a peck; what did he get for them?

2. How many strawberries at 8 cents a pint can you buy for 96 cents? How many quarts?

3. What cost 6 quarts of pop-corn at 4 cents a pint?

4. A lad sold 8 quarts of blackberries at 9 cents a quart, and paid 5 cents for car-fare and 1 cent for crossing the ferry; how much money had he left?

5. What part of a pint is 1 gill? 2 gills? 3 gills?

6. What part of a peck is 1 quart? 4 quarts? 8 quarts?

7. What part of a bushel is 1 peck? 2 pecks? 3 pecks?

WRITTEN EXERCISES.

1. What will 23 barrels of apples cost at $3.25 a barrel?

2. In 365 bushels and 3 pecks how many pecks?

3. A planter raised 15265 pounds of cotton which he sold at 12 cts. a pound; how much did it come to?

4. At $4 a barrel, how many barrels of cranberries can be had for $684?

5. A farmer raised 1525 bushels of corn, which he sold for 80 cents a bushel; how much did it come to?

6. How many bushels of clover-seed, at $6 a bushel, can be had for $576?

7. How many bushels in 296 baskets of peaches, allowing a peck to each basket?

8. What will they come to at $5 a bushel?

LESSON XVIII.

Time.

Time is measured by clocks, watches, etc.

TABLE.

60 seconds (*sec.*)	=	1 minute,	*min.*
60 minutes	=	1 hour,	*hr.*
24 hours	=	1 day,	*d.*
7 days	=	1 week,	*w.*
365 days, or 12 months	=	1 common year,	*yr.*
366 days	=	1 leap year,	*yr.*
100 years	=	1 century.	*C.*

1. Name the days of the week, beginning with Sunday.
2. Name the months in their order.

Ans. January, February, March, April, May, June, July, August, September, October, November, December.

3. Give the names of the seasons and the months of each.

Ans. **Spring** consists of March, April, and May.
Summer " June, July, and August.
Autumn " September, October, and November.
Winter " December, January, and February.

4. Name the months having 30 days, etc.

"Thirty days hath September,
April, June, and November."

Each of the other months has 31 days, except February, which in common years has 28 days, but in leap years 29.

5. How many days in 3 weeks? In 5 weeks? In 7 weeks?
6. How many weeks in 28 days? In 42 days?
7. How many months in 2 years? In 3 years? 5 years?
8. How many years in 24 months? 48 mo.? 36 mo.?

LESSON XIX.

ORAL EXERCISES.

1. How many hours in 3 days? In 4 days?
2. How many days in 48 hours? In 72 hours?
3. How many minutes in 2 hours? In 3 hours?
4. If a man walks 4 miles an hour, how far will he walk in 6 hours? In 8 hours?
5. If a man pays $6 a week for board, what will his board come to for 9 weeks?
6. If a lad earns $8 a month, how much will he earn in 7 months? How long will it take him to earn $80?

WRITTEN EXERCISES.

7. How many weeks in 365 days? How many hours?
8. How many days in 365 weeks? In 842 weeks?
9. If the expenses of a family are $75 a week, what will they come to in 52 weeks?
10. If a steamboat goes 220 miles a day, how far will she go in a week?
11. If a man rides 8 miles an hour, how long will it take him to go 1168 miles?
12. A man earned $125 a month, how much did he earn in a year? In 5 years?
13. If a clerk spends $15 a week, how much will he spend in 52 weeks?
14. If a man's salary is $25000 a year how much is that a month?
15. If a man pays $7 a week for board, how long can he board for $364?

LESSON XX.

REVIEW.

1. How many pecks in 245 quarts, and how many quarts over?

2. How many quart boxes of strawberries in 6 bushels?

3. At 15 cents a box, what would they come to?

4. At $4 a bushel, how many bushels of oranges can you buy for $356?

5. If a cistern holds 84 hogsheads of water, how long will it take to empty it, if it discharges 7 gallons an hour?

6. What cost 4 barrels of maple syrup at 15 cents a quart? At 22 cents a quart?

7. A condensed milk company bought 285 gallons of one farmer, 387 of another, and 452 of another; how much milk did they buy in all?

8. At 3 cents a quart, how much did the company pay for the milk?

9. At $2 a gallon, how much oil can be bought for $1268? For $2500?

10. A grocer bought 6 barrels of vinegar at $12 a barrel, and sold it for $5 a barrel more than he paid; what did he get for the vinegar, and how much did he make?

11. Bought 5 hogsheads of molasses for $150, and sold it at 40 cents a gallon; how much did I receive, and what was my loss?

12. Find the difference in cost of 250 gal. of milk at 18 cents a gal., and 560 quarts of vinegar at 12 cents a quart?

(See Appendix, p. 141.)

SECTION VI.

LESSON I.

Second Method of expressing Division.

1. Division is often expressed by writing the divisor *under* the dividend, with a line between them.

Thus, $\frac{8}{4}$ means the same as $8 \div 4$. It is read "8 fourths."

2. This form of expressing division is the same as that used in expressing **Fractions.**

3. When a number or thing is divided into *two* equal parts, what is *one* of the parts called?

Ans. **One-half**; written $\frac{1}{2}$.

4. What is 1 half of 2? What part of 2 is 1?

5. If a pear is divided into 2 equal parts, what are the parts called?

6. How many *halves* make a unit or whole thing?

7. If a pear is divided into *three* equal parts, what is *one* of the parts called?

Ans. **One-third**; written $\frac{1}{3}$.

8. What is 1 third of 3? What part of 3 is 1?

9. If a pear is divided into 4 equal parts, what are the parts called?

10. How many *fourths* make a unit, or one?

LESSON II.

1. How find *one-half* a number?

Ans. Divide it by 2.

2. How find *one-third* a number? *two-thirds?*

3. What part of 3 is 2?

Ans. Two times 1 third of 3, or 2 thirds of 3.

4. What is $\frac{1}{2}$ of 10? Of 16? Of 20? Of 24?

5. What is $\frac{1}{3}$ of 9? $\frac{2}{3}$ of 9? Of 12? 18? $\frac{1}{3}$ of 24?

6. What is 1 third of 21 oranges? Of \$15? $\frac{2}{3}$ of \$24?

7. How find *one-fourth* a number? *Three-fourths?*

8. What is $\frac{1}{4}$ of 12? $\frac{3}{4}$ of 12? Of 16? 32? 48?

9. If you have 30 cents, what part of it must you pay for a 5-cent stamp? For two 3-cent stamps?

10. What is 1 fifth of 10 cents? Of 20 apples? Of 40?

Perform the following divisions:

11. $\frac{28}{4} = ?$	14. $\frac{42}{6} = ?$	17. $\frac{54}{9} = ?$	20. $\frac{72}{8} = ?$
12. $\frac{21}{3} = ?$	15. $\frac{56}{7} = ?$	18. $\frac{48}{6} = ?$	21. $\frac{63}{9} = ?$
13. $\frac{45}{9} = ?$	16. $\frac{48}{12} = ?$	19. $\frac{63}{7} = ?$	22. $\frac{72}{12} = ?$

23. A man having 358 acres of land, sold 1 half of it; how many acres did he sell?

EXPLANATION.—We divide 358 acres by 2 to find one-half, and the quotient is 179.

Ans. 179 acres.

2) 358 acres.

Quot. 179 acres.

24. If he paid \$25 an acre for his farm, and sold 1 half of it at \$30 an acre; how much did his own half cost him?

25. Find 1 fourth of 1620.

26. Find 1 fifth of 2240.

27. Find 1 sixth of 2418?

28. Find 1 eighth of 4320?

LESSON III.

ORAL EXERCISES.

1. If you divide 4 cents into two equal parts; how many cents in each part?

2. Joseph had 6 cents and gave 1 half his money for a pear; how many cents did the pear cost him?

3. If you have half an apple and I give you 3 halves more, how many apples will you have?

4. How many apples in 9 halves? In 16 halves?

WRITTEN EXERCISES.

1. If 43 oranges are divided equally among 3 boys, what part and how many oranges will each boy receive?

EXPLANATION.—One boy is 1 third of 3 boys, and will receive 1 *third* part of the oranges. Now 43 divided by 3 equals 14, and 1 remainder.

$$3\overline{)43}$$

Ans. $14\frac{1}{3}$

NOTE.—When there is a remainder, it should be written over the divisor and placed at the right to complete the quotient.

2. If 55 pears are divided equally between 2 boys, what part and how many pears will each boy have?

3. A farmer divided 260 apples equally among 4 schoolboys; what part and how many did he give to each?

4. William divided 75 cents equally among 5 poor children; what part and how many cents did each have?

5. When a number or thing is divided into *equal* parts, the *parts* are called **Fractions.**

6. Express in figures: Three-fifths; four-fifths; one-sixth; five-sixths; two-sevenths; three-sevenths; six-sevenths; five-eighths; seven-eighths; four-sevenths; seven-tenths.

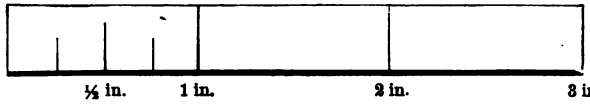
LESSON IV.

Long Measure.

Long Measure is used in measuring lines, distances, etc.

TABLE.

12	inches (*in.*)	=	1 foot,	*ft.*
3	feet	=	1 yard,	*yd.*
5½	yds., or 16½ ft.,	=	1 rod,	*rd.*
40	rods	=	1 furlong,	*fur.*
320	rods, or 5280 ft.,	=	1 mile,	*mi.*
3	miles	=	1 league,	*l.*



1. The above cut is a measure of three inches.

The first inch on the left is divided into *halves* and *fourths.*

2. Draw a line 1 inch long. 2 inches. 3 inches.
3. How many inches make a foot?
4. Draw a line a foot long.
5. How many inches in 2 feet? 3 feet?
6. How long is your slate? How wide?
7. How many feet make a yard?
8. How many yards in 6 feet? 12 feet?
9. Draw a line a yard long on the blackboard.

NOTE TO TEACHERS.—It is advisable to show the class a foot-rule divided into inches, etc., and a yard-stick divided into feet, etc., and allow them to measure the length of different objects.

ORAL EXERCISES.

1. How many inches in 1 half foot? 1 third? 1 fourth?
2. What part of a foot is 1 inch? 3 in.? 4 in.? 6 in.?
3. How many feet in 1 third yard? In 2 thirds?
4. What part of a yard is 1 foot? 2 feet?
5. If a man can dig a trench 5 rods long in 1 day, how long a trench can he dig in 8 days?
6. If a man makes 8 rods of fence a day, how long will it take him to make 48 rods of fence?

WRITTEN EXERCISES.

1. How many yards are there in 48 rods?

ANALYSIS.—As there are $5\frac{1}{2}$ yards in 1 rod, there must be $5\frac{1}{2}$ times as many yards as rods. 5 times 48 are 240, and $\frac{1}{2}$ of 48 is 24, which added to 240 is 264, the product.

2) 48 rods.
$5\frac{1}{2}$
240, by 5.
24, by $\frac{1}{2}$.
Ans. 264 yd.

NOTE.—Multiplying by $\frac{1}{2}$, is taking 1 *half* of the multiplicand *once*. Multiplying by $\frac{1}{3}$, is taking 1 *third* of the multiplicand *once*.

Multiplying by $\frac{2}{3}$, is taking 1 *third* of the multiplicand *twice*. Multiplying by $\frac{3}{4}$, is taking 1 *fourth* of the multiplicand 3 times.

	2.	3.	4.	5.
Multiply	324	456	6428	6820
By	$4\frac{1}{2}$	$5\frac{2}{3}$	$7\frac{3}{4}$	$8\frac{1}{5}$

6. A merchant bought 55 bales of goods; each bale contained 32 pieces, and each piece $28\frac{3}{4}$ yards; how many yards did he buy?
7. If a steamer sails 268 miles in 1 day, how far will she sail in $10\frac{1}{2}$ days?

LESSON V.

When the Divisor has Two Figures.

1. Divide 1242 by 23.

EXPLANATION.—As 23 is not contained in 12, we find how many times it is contained in 124. Now 2 is in 12, 6 times; but there is 1 to carry from the product of 3 by 6; therefore 23 is contained in 124 only 5 times. Now 5 times 23 is 115. Subtracting this product and bringing down the next figure of the dividend, we have 92 for a partial dividend. 23 is contained in 92, 4 times and no remainder. *Ans.* 54.

```
23 ) 1242 ( 54
     115
     ---
      92
      92
```

NOTES.—1. If the *product* of the divisor into the quotient figure is *greater* than the partial dividend, the quotient figure is *too large*, and must be *diminished*.

2. If the *remainder* is *equal* to or *greater* than the *divisor*, the quotient figure is *too small*, and must *be increased*.

2. Divide 1562 by 21, and prove the work.

Divisor. Dividend. Quotient.

```
21 ) 1562 ( 74 8/21
     147
     ---
      92
      84
      --
       8  Rem.
```

PROOF.

```
 74 8/21  Quot.
      21  Divisor.
     ---
      74
     148
       8  Rem.
     ----
    1562  Dividend.
```

3. 22) 2563 (

4. 23) 2647 (

5. 25) 3682 (

6. 27) 6384 (

7. If a stage-coach goes 6 miles an hour, a steamboat 15 miles, and a rail-car 24 miles an hour, how long will it take each to go 360 miles?

ORAL EXERCISES.

1. If you have 25 cts. and spend 10 cts. for a slate, and the rest of the money for oranges at 3 cts. apiece, how many oranges will you buy?

2. Katie had 16 cents and her mother gave her 20 more; how many yards of ribbon at 9 cts. a yard can she buy?

3. Eight boys went chestnutting, and gathered 64 quarts, which they shared equally; what part and how many quarts did each boy receive?

4. One boy on his way home sold his share for 12 cents a quart; how much did he get for his chestnuts?

5. How many 9's in 54? How many 6's in 48?

WRITTEN EXERCISES.

1. How many dress patterns, at $21 each, will $525 buy?

2. How many barrels of beef, at $22 a barrel, can be bought for $1234?

3. A farmer sold 340 cords of wood, at $6 a cord, and took his pay in flour, at $8 a barrel; how many barrels did he receive?

4. A man having 250 sheep, bought 7 more; during the winter he lost 125 by sickness; how many had he left?

5. A man paid $250 for a horse, and exchanged it for another, paying $125 more, which he sold for $350; did he make or lose by the bargain and how much?

6. A man bought 150 acres of land, at $12 an acre, and sold 60 acres of it at $15 an acre; how much did his present farm cost him, and how many acres did it contain?

7. At $18 a ton, how many tons of hay can be bought for $432?

LESSON VI.

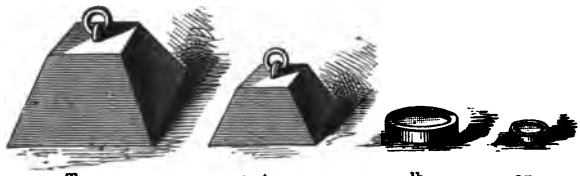
Avoirdupois Weight.

Avoirdupois Weight is used for weighing common articles, as tea, sugar, butter, rice, hay, etc.

TABLE.

16 ounces (*oz.*)	=	1 pound,	*lb.*
100 pounds	=	1 hundred weight,	*cwt.*
20 cwt., or 2000 lbs.,	=	1 ton,	*T.*

NOTE.—8 ounces are ½ pound. 4 ounces are ¼ pound.



Ton. cwt. lb. oz.

1. How many ounces in 2 pounds and 1 half?
2. How many ounces in 2 pounds and 1 fourth?
3. In 36 oz., how many pounds and how many oz. over?
4. A grocer had 36 pounds of sugar which he divided equally in 6 bags; how many pounds did each bag contain?
5. What part of the sugar did each bag contain?
6. How many hundreds in 2 tons?
7. If a pint of water weighs 1 pound, how much will a quart weigh? 4 quarts? 8 quarts?
8. How many lb. in 3 tons? 5 tons? In 1 half ton?
9. At 60 cents a pound, how much must you pay for 1 half pound of tea? 1 third pound? 1 fourth pound?

LESSON VII.

When the Multiplier contains a Fraction.

1. If a pound of salt costs 4 cents, what cost 1 half pound?

Ans. 1 half pound will cost half of 4 cts., which is 2 cents.

2. If a pound of flour is worth 6 cents, what is 1 half pound worth? What 1 third pound?

3. If 1 yard of braid is worth 4 cents, what are 2 and 1 half yards worth?

EXPLANATION.—2 and 1 half yards are worth 2 and 1 half times 4 cents. Now 2 times 4 cents are 8 cents, and 1 half of 4 cents is 2 cents, which added to 8 cents make 10 cents.

4. If a pound of maple sugar costs 12 cents, what must you pay for 3 and 1 half pounds? 4 and 1 half pounds?

5. What is the product of 256 multiplied by $8\frac{1}{2}$?

SOLUTION.—We first multiply the multiplicand by 8 in the usual way; then by $\frac{1}{2}$ by dividing it by 2.

$2\overline{)256}$

$8\frac{1}{2}$

The product of 256 by 8 = 2048

The product of 256 by $\frac{1}{2}$ = 128

Uniting these partial products, the entire product = 2176, *Ans.*

6.	7.	8.
$856 \times 7\frac{1}{2} = ?$	$1234 \times 4\frac{1}{3} = ?$	$1568 \times 6\frac{1}{4} = ?$
$975 \times 8\frac{1}{3} = ?$	$1376 \times 7\frac{2}{3} = ?$	$1684 \times 9\frac{3}{4} = ?$

9. If a barrel of flour weighs 196 pounds, what will $9\frac{2}{3}$ barrels weigh?

10. If a vessel sails 268 miles a day, how far will she sail in $10\frac{3}{4}$ days?

11. A grocer sold 360 pounds of sugar at $8\frac{3}{4}$ cents a pound; how much did it come to?

LESSON VIII.

ORAL EXERCISES.

1. How many stage rides, at 1 half dime each, can you take for 60 cents?

2. How many quarts of beans, at 6 cts. a quart, can you buy for 50 cts., and how much change will you have?

3. What part of 6 cts. is 1 cent? 2 cts.? 3 cts.?

4. If you divide 20 qts. of berries into 5 equal parts, how many qts. and what part of the berries will be in each part?

5. When milk is 8 cts. a quart, how many qts. and what part of a qt. can you buy for 25 cents?

6. If rice is 5 cts. a pound, how many pounds and what part of a pound can you buy for 42 cents?

WRITTEN EXERCISES.

	1.	**2.**	**3.**	**4.**	**5.**
Multiply	3025	4352	6414	8628	9740
By	$10\frac{2}{5}$	$9\frac{3}{4}$	$11\frac{2}{3}$	$12\frac{3}{4}$	$12\frac{1}{5}$

6.	**7.**	**8.**	**9.**	**10.**
11)3827	11)5240	11)6427	11)7329	11)8463

11.	**12.**	**13.**	**14.**	**15.**
12)4829	12)5229	12)6537	12)7843	12)9986

16. If a train of cars goes 450 miles in a day, how far will it go in $18\frac{1}{2}$ days?

17. If a farmer sells 350 pounds of butter at 35 cents a pound, and takes his pay in flour at $6 a bar., how many barrels of flour does he get?

LESSON IX.

Drill in Adding and Subtracting.

To TEACHERS.—These exercises should be dictated slowly at first, increasing in speed as the pupils are able to follow. The answers may be given in concert or individually, at the option of the teacher. As the teacher names the operations in order, the pupils perform each mentally, and at the close pronounce the final result.

ORAL.—1. To 3 add 4, subtract 5, add 8, subtract 3, add 6, subtract 5, add 7, subtract 6, add 8, result?

Thus, when the teacher says, "to 3 add 4," the class think "7," "subtract 5," think "2," "add 8," they think "10," and so on.

2. From 7 take 3, add 6, take 4, add 9, take 5, add 8, take 9, add 7, take 10, add 9, take 7, result?

3. To 11 add 3, take 6, add 7, take 5, add 6, take 4, add 8, take 3, add 8, take 7, result?

4. From 14 take 6, add 9, take 6, add 7, take 5, add 10, take 3, add 8, take 6, add 9, result?

5. To 17 add 5, take 6, add 8, take 7, add 10, take 9, add 12, take 10, add 7, take 11, result?

SLATE.—1. Add 4318 to $12919+845.30+73960-47829=?$

2. To 6220 add $3820+7201+4856-8720=?$

3. $21508+54739-73890+1070+9037=?$

4. $62860\div 2684+1075-280+500=?$

5. James Henry earned \$1.25 on Monday, and spent 60 cents; Tuesday he earned \$1.05, and spent 78 cents; Wednesday he earned 87 cts., and spent 45 cts.; Thursday he earned \$1.10, and spent \$1; Friday he earned 96 cts., and spent 80 cts.; Saturday he earned \$1.40, and spent \$1.15; how much had he at the end of the week?

LESSON X.

When the Multiplier has Three or More Figures.

1. Multiply 335 by 234.

We first multiply by the 4 ones, next by the 3 tens, then by the 2 hundreds.

	335
	234
The product of 335 by 4 ones	= 1340
The product of 335 by 3 tens	= 1005
The product of 335 by 2 hundreds	= 670
Adding partial products, the entire product	= 78390

NOTE.—The pupil will observe that the first figure of each partial product is placed directly under the figure used as a multiplier.

	2.	3.	4.	5.	6.
Multiply	3476	4215	5420	6832	7941
By	529	449	684	493	797

	7.	8.	9.	10.	11.
Multiply	76142	70436	68540	85704	96207
By	410	511	617	2712	3872

12. In 1 year there are 365 days; how many days in 153 years? In 250 years?

13. In 1 mile are 5280 feet; how many feet in 325 miles?

14. In 1 ton are 2000 pounds; how many pounds in 568 tons? In 875 tons?

15. A railroad company bought 49 passenger cars, at $1575 apiece, and 27 engines at $1850 apiece; what did both cost them?

16. What will it cost to build 275 miles of railroad, at $2345 a mile?

LESSON XI.

Troy Weight.

Troy Weight is used to weigh gold, silver, jewels, etc.

TABLE.

24 grains (*gr.*)	=	1 pennyweight,	*pwt.*
20 pennyweights	=	1 ounce,	*oz.*
12 ounces	=	1 pound,	*lb.*

ORAL EXERCISES.

1. How many grains in 2 pennyweights?
2. How many pwts. in 2 oz.? 3 oz.? 5 oz.? 4 oz.?
3. How many ounces in 2 lbs.? 3 lbs.? 5 lbs.? 8 lbs.?
4. In 48 grains, how many pennyweights?
5. In 40 pwt., how many ounces? In 42 pwt.? In 60 pwt.? In 68 pwt.?
6. In 24 ounces, how many pounds? In 39 ounces?

WRITTEN EXERCISES.

1. How many grains in 342 pennyweights? In 387 pwt.?
2. How many pennyweights in 265 ounces? In 310 oz.?
3. How many oz. in 368 pounds? In 423 lb.?
4. How many oz. in 268 gr.? In 484 grains?
5. How many lb. in 324 oz.? In 658 ounces?
6. How many rings, weighing 75 grains each, can be made from 250 pwt. of gold?
7. What is the weight of 2500 silver dollars, allowing 412½ grains to a dollar?
8. How many silver cups, weighing 10 ounces 15 pwt., can be made from 1350 ounces of silver?

LESSON XII.

When the Multiplier or Divisor is 10, 100, 1000, etc.

1. What is the product of 4 multiplied by 1000?

NOTE.—It has been shown that moving a figure one place to the left multiplies it by 10, moving it two places multiplies it by 100, moving it three places multiplies it by 1000 (page 55). Thus, 4 denotes 4 ones, and 4 with three 0's denotes 4 thousands, or 1000 times 4 ones. *Ans.* 4000. Hence,

I. *To multiply a number by* ***10****, place one cipher on the right.*

II. *To multiply by* ***100****, place two ciphers on the right.*

III. *To multiply by* ***1000****, place three ciphers on the right.*

2. Divide 3758 by 100.

NOTE.—Since each cipher added to the right of a number multiplies it by 10, it is plain that each cipher or figure cut off from the right of a number divides it by 10. The figures cut off are the remainder.

Thus, $3758 \div 100 = 37|58$, or $37\frac{58}{100}$, *Ans.* Hence,

I. *To divide by* ***10****, cut off one figure from the right.*

II. *To divide by* ***100****, cut off two figures from the right.*

III. *To divide by* ***1000****, cut off three figures from the right.*

3. How many dollars in 1000 dimes? How many cents?

4. How many cents in 175 dimes? In 250 dimes?

5. How many cents in 348 dollars? In 500 dollars?

6. Multiply 45 by 100, and divide the product by 9?

7. Multiply 32 by 1000, and divide the product by 8?

8. At $47 apiece, what cost 10 cows? What 100?

9. What will 10 horses cost, at $235 each? What will 100 cost at the same price?

10. At $725 apiece, what will 10 carriages cost? 100?

11. What will 1575 acres of land cost, at $100 an acre?

LESSON XIII.

Drill in Multiplying and Dividing.

ORAL.—1. Multiply 4 by 3, divide the product by 2, multiply by 4, divide by 8, multiply by 6, divide by 9, multiply by 10, divide by 5; what is the result?

2. Multiply 6 by 4, divide by 3, multiply by 5, divide by 10, multiply by 6, divide by 8, multiply by 10, divide by 6, multiply by 4, divide by 2; result?

3. Divide 10 by 2, multiply by 12, divide by 10, divide by 2, multiply by 12, divide by 9, multiply by 8, divide by 4, multiply by 6; result?

4. Divide 20 by 5, multiply by 9, divide by 12, multiply by 7, divide by 3, multiply by 5, divide by 7, multiply by 8, divide by 10; result?

SLATE.—1. Multiply 63 by 8, divide by 9, multiply by 7, divide by 4, divide by 2, multiply by 16, divide by 8; what is the result?

2. Multiply 24 by 16, divide by 12, multiply by 20, divide by 40, multiply by 3, divide by 4, multiply by 38; result?

3. Divide 40 by 8, multiply by 48, divide by 10, multiply by 24, divide by 6, multiply by 45, divide by 9; result?

4. A trader bought 215 buffalo robes at $8 apiece, and sold the lot for $985; did he make or lose, and how much?

5. A man has $3500 to buy books; he paid $3 a vol. for 250 books, $4 a vol. for 375, and $5 a vol. for 160; how many books did he buy; how much did he pay for all, and how much money had he left?

6. How many volumes, at $9 each, can he buy with the remainder of his money?

LESSON XIV.

Juvenile Expense Account.

1. A school-boy on Jan. 1st had on hand $3.75; Jan. 3d, received for shoveling snow-path 25 cts.; Jan. 6th, received from his father $8; Jan. 8th, for sawing wood 20 cts., Jan. 10th, for doing errands 25 cts.; Jan. 25th, from his sister, $3.50.

On Jan. 3d, he paid for skates $2.10; Jan. 7th, for mittens 75 cts.; Jan. 9th, for Reader 84 cts.; Jan. 10th, gave a poor boy 50 cts.; Jan. 15th, for Writing-book 15 cts.; Jan. 23d, for sled $1.25. How much did he have on hand Jan. 31st.?

SOLUTION.—The pupil may arrange the work as follows:

RECEIPTS.

Jan.	1st.	On hand		$3.75
"	3d.	Received for shoveling snow-path		0.25
"	6th.	" from father		8.00
"	8th.	" for sawing wood		0.20
"	10th.	" for doing errands		0.25
"	25th.	" from sister		3.50
		Amount of receipts		

EXPENSES.

Jan.	3d.	Paid for skates	$2.10	
"	7th.	" for mittens	0.75	
"	9th.	" for Reader	0.84	
"	10th.	Gave poor boy	0.50	
"	15th.	Paid for Writing-book	0.15	
"	23d.	" for sled	1.25	$5.59
		On hand		

NOTE.—Teachers will do their pupils valuable service, by supplementing the above exercise.

LESSON XV.

ORAL EXERCISES.

1. If a loaf of bread cost 8 cents, what cost 1 half loaf?

Ans. 1 half loaf will cost 1 half as much as a whole loaf, and 1 half of 8 cents is 4 cents.

2. What is 1 half of 18 cents? Of 20 cents? 28 cents?

3. If a peck of apples cost 12 cts., what cost 1 half peck?

4. If a yard of ribbon cost 9 cents, what will 1 third of a yard cost? What will 2 thirds cost?

5. What is 1 third of 12? 2 thirds of 12? Of 21?

6. If a gallon of milk costs 16 cents, what will 1 fourth of a gallon cost? 2 fourths? 3 fourths?

WRITTEN EXERCISES.

1. Multiply 432 by $14\frac{1}{2}$.
2. Multiply 526 by $25\frac{1}{2}$.
3. Multiply 366 by $35\frac{3}{5}$.
4. Multiply 429 by $12\frac{2}{3}$.
5. Multiply 528 by $26\frac{1}{4}$.
6. Multiply 644 by $37\frac{1}{4}$.

7. If a train of cars runs 450 miles in a day, how far will it run in $28\frac{2}{3}$ days?

8. If 1 village house-lot costs $560, what cost $19\frac{1}{4}$ lots?

9. In 1 mile are 320 rods; how many rods in $92\frac{3}{4}$ miles?

10. At $127 an acre, what cost $78\frac{1}{2}$ acres of land?

Divide the following examples as before:

11.	12.	13.	14.
22) 1046 (	24) 1848 (	26) 3265 (	27) 4860 (
15.	**16.**	**17.**	**18.**
32) 3842 (	34) 4328 (	35) 3263 (	42) 7348 (

LESSON XVI.

Combination Drill for Review.*

ORAL.—1. To 4 add 8, subtract 2, multiply by 3, divide 5, add 4, multiply by 3, add 10; result?

2. From 12 subtract 5, add 2, multiply by 4, divide by 6, add 5, multiply by 3; result?

3. Multiply 3 by 6, add 4, subtract 2, divide by 5, multiply by 6, add 8, divide by 4; result?

4. Divide 42 by 7, multiply by 4, subtract 6, divide by 3, add 5, add 9, divide by 5, multiply by 11; result?

5. To 14 add 8, take 4, divide by 9, multiply by 8, add 8, divide by 8, multiply by 9; result?

6. From 27 take 9, divide by 9, multiply by 9, add 9, take 7, multiply by 2, divide by 10; result?

7. Divide 54 by 9, multiply by 7, subtract 6, divide by 9, multiply by 8, add 7, subtract 4, divide by 7, add 30; result?

SLATE.—1. To 36 add 45, subtract 37, multiply by 6, divide by 8, multiply by 9, add 99, divide by 9; result?

2. From 87 take 33, multiply by 7, divide by 6, add 233, take 48, divide by 8, multiply by 25; result?

3. Multiply 328 by 9, add 556, divide by 8, multiply by 48, divide by 24, add 545, take 378; result?

4. Divide 576 by 24, multiply by 35, add 1200, divide by 20, multiply by 45, take 375, add 2375; result?

5. To 785 add 357, take 571, add 629, divide by 24, multiply by 64, divide by 32, add 873, take 367; result?

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* These exercises should be continued but a few minutes at a time. If *spirited* and *frequent*, better results will be obtained from them, though short, than from scores of examples recited in an *indifferent, sluggish* manner.

LESSON XVII.

ORAL EXERCISES.

1. What will 4 pears cost, at $2\frac{1}{2}$ cents apiece?

ANALYSIS.—If 1 pear costs $2\frac{1}{2}$ cents, 4 pears will cost 4 times $2\frac{1}{2}$ cents. Four times 1 half are 4 halves, which are equal to 2; four times 2 are 8, and 2 make 10. *Ans.* 10 cents.

2. What will 7 yards of braid cost, at $6\frac{1}{4}$ cents a yard?
3. At $12\frac{1}{2}$ cents apiece, what will 10 melons cost?
4. At $8\frac{2}{3}$ cents a pound, what cost 7 pounds of sugar?
5. What cost 8 weeks board, at $\$5\frac{3}{4}$ a week?

WRITTEN EXERCISES.

1. How many feet in 7 rods?

ANALYSIS.—Since in 1 rod there are $16\frac{1}{2}$ ft. in 7 rods there are 7 times $16\frac{1}{2}$ ft. Now 7 times 1 half are 7 halves, equal to $3\frac{1}{2}$. Setting down $\frac{1}{2}$, we multiply 16 by 7 in the usual way, and adding the 3, the entire product is $115\frac{1}{2}$ ft., *Ans.*

$16\frac{1}{2}$ ft.
7
Ans. $115\frac{1}{2}$ ft.

2. How many gallons in 12 barrels of water?
3. At $\$45\frac{1}{2}$ a ton, what must you pay for 12 tons of iron? For 20 tons? For 35 tons?
4. At $\$54\frac{1}{2}$ apiece, how much will a manufacturer receive for 25 book-cases.

5.	6.	7.
$231\frac{1}{2} \times 8 = ?$	$346\frac{2}{3} \times 9 = ?$	$576\frac{3}{4} \times 11 = ?$
$845\frac{3}{8} \times 15 = ?$	$1473\frac{3}{8} \times 12 = ?$	$2175\frac{5}{8} \times 20 = ?$

8. Write in Roman Numerals: 14, 19, 24, 40, 29, 36, 44, 59, 66, 38, 85, 77, 88, 94, 99, 103, 109, 416, 644, 868, 1005.

LESSON XVIII.

ORAL EXERCISES.

1. A man divided $6 equally among some beggars, giving 2 thirds dollar to each; how many beggars were there?

ANALYSIS.—In one dollar there are 3 thirds, and in 6 dollars, 6 times 3, or 18 thirds. Now 2 thirds are in 18 thirds, 9 times. *Ans.* 9 beggars.

2. A lady divided 6 loaves of bread among some boys, giving 2 fifths loaf to each; how many boys were there?

3. If peaches are $1\frac{1}{2}$ cents each, how many can you buy for 6 cents?

ANALYSIS.—$1\frac{1}{2} = 3$ halves, and 6 cents $= 12$ halves; 3 halves are in 12 halves, 4 times. *Ans.* 4 peaches.

4. At $6\frac{1}{4}$ cents a spool, how many spools of sewing-silk can be bought for 25 cents?

WRITTEN EXERCISES.

1. How many rods in 242 yards?

ANALYSIS.—As there is 1 rd. in $5\frac{1}{2}$ yards, in 242 yards there are as many rods as $5\frac{1}{2}$ are contained times in 242. Reducing both numbers to halves, $5\frac{1}{2} = \frac{11}{2}$, $242 = \frac{484}{2}$, and 484 divided by $11 = 44$ rods, *Ans.*

$5\frac{1}{2}$) 242 yds.
2 2
11) 484
Ans. 44 rds.

2. At $12\frac{1}{2}$ an acre, how much land can be bought for $200?

3.	4.	5.
$236 \div 7\frac{1}{3} = ?$	$452 \div 12\frac{2}{3} = ?$	$458 \div 15\frac{3}{4} = ?$
6.	**7.**	**8.**
$648 \div 18\frac{2}{5} = ?$	$763 \div 20\frac{1}{2} = ?$	$1292 \div 18\frac{4}{7} = ?$

LESSON XIX.

MISCELLANEOUS TABLE.

2 things are called a pair; as a pair of gloves.
6 things are called a set; as a set of chairs.

12 things	make	1	dozen, *doz.*
12 dozen	"	1	gross.
12 gross	"	1	great gross.
20 things	"	1	score.
24 sheets (paper)	"	1	quire.
20 quires	"	1	ream.

1. How much would a market-woman get for 6 dozen eggs, if she sold them at 12 cents a dozen?

2. How many things in 7 dozen? 5 dozen? 8 dozen?

3. How many sheets of paper in 2 quires? In 3 quires?

4. How many quires in 2 reams? In 3 reams? 5 reams?

5. A dairy-woman had 60 pounds of butter, which she wished to pack in 1 dozen equal boxes; how many pounds could she put in a box?

6. At 5 cents a dozen, what will a gross of buttons cost?

7. A farmer had 5 bins of grain, each containing a score of bushels; how much grain did he have?

8. How old is a man who has lived 3 score and 10 years?

9. A creamery made 763 cheeses, each weighing a score of pounds; how many pounds were made?

10. A button factory made 75 gross of one kind of buttons and 48 gross of another kind; how many dozen were made of both kinds?

11. A grocer divided 762 pounds of flour among several poor families, giving them a dozen pounds each; how many families were supplied?

LESSON XX.

Questions for Review.

1. A young pear tree had 3 pears on it the first year, twice as many the second year, and the third year twice as many as the second year; how many pears had it in 3 years?

2. Louise is 16 years old, and Carrie is half as old; how old is Carrie? How much older is Louise than Carrie.

3. Florence made a visit of 5 weeks at her grandmother's; how many days was she there?

4. Harry went on a fishing excursion of 63 days; how many weeks was he gone?

5. How many cents in 3 dimes and a half-dime?

6. How many cents in a quarter-dollar, 2 dimes, and a half-dime?

7. How many cents are in a half-dollar, quarter-dollar, a dime, and a half-dime?

8. If a man travels 12 miles an hour, how long will it take him to travel 84 miles?

9. If a man is 72 miles from home and travels 6 miles an hour, how long will it take him to reach home?

10. Two men start from the same place and travel in opposite directions, one going 6 miles an hour, the other 5 miles an hour; how far apart will they be in 10 hours?

11. At 5 cents a spool, how many spools of cotton can you buy for 6 dimes?

12. How many cents are in 8 and a half dimes?

13. How many dollars are in 48 quarter-dollars?

14. If a street-sprinkler holds 6 barrels of water, how many barrels would 7 sprinklers hold?

15. If a cistern contains 9 hogsheads of water, how many gallons does it hold ?

16. How many dollars are in 25 half-dollars ?

17. If 1 pound of cinnamon costs 24 cents, what will 2 and a half pounds cost ?

18. A gardener sold 120 strawberry-plants to one person, 240 to another, 32 to another, and 105 to another; how many plants did he sell to all ?

19. A man bought a farm and paid $220 down, $130 in one month, $320 in 2 mo., and the rest, which was $125, in 3 months ; how much did he pay for his farm ?

20. A gentleman paid $1650 for his carriage and horses ; the carriage cost $230 less than his horses; what did his horses cost ?

21. A coal-dealer sold 275 tons of coal at $6 a ton, and took his pay in hay at $25 a ton; how much hay did he receive ?

22. How many dozen eggs in a barrel which contains 564 eggs ?

23. In the primary department of a certain school there were 235 girls and 186 boys; in the grammar department, 126 girls and 110 boys ; in the academic department, 65 girls and 48 boys ; how many pupils were in the school ? How many more girls than boys ?

24. How many cans, holding 8 gallons each, are required to hold 1568 gallons of milk ?

25. How many bags of flour, each containing 24½ lbs., can be put up from 20 barrels ?

26. A barrel of flour contains 196 pounds ; how many loaves of bread, each weighing 1 lb., can be made from 35 barrels of flour ?

27. A regiment of soldiers was arranged in 21 lines, with 24 in a line; how many were in the regiment? How many more soldiers would be needed to make 24 lines?

28. A farmer planted 1107 hills of corn in rows of 27 hills each; how many rows did he plant?

29. Multiply 752 by 36, and divide the product by 25.

30. A man started in business with $2575, and the first year made $850; the second year he lost $1000; how much had he left?

31. What must be paid for 25 cords of wood, at $4 a cord, and 28 tons of coal, at $6 a ton?

32. What is the cost of 48 barrels of flour, at $7 a barrel, and 20 barrels of pork, at $12 a barrel?

33. If a man earns $9 a week, how much will he earn in a year? If he spends $6 a week, how much will he lay up in a year?

34. If 12 bu. pears cost $48, what cost 1 bu.? A peck?

35. What cost 63 gal. of maple syrup, at 12 cts. a quart?

36. How much will 350 acres of land cost, at $37 an acre?

37. How many oranges in 48 boxes, if each box contains 250 oranges?

38. How many days old is a person who has lived 3 score and 10 common years?

39. If from 320000 you subtract 116000, and to the remainder add 4520, what will be the sum?

40. If the sum of 4260 + 1803 is multiplied by 48, what will be the product?

41. If the difference between 8356 and 9408 is divided by 12, what is the quotient?

42. A has 3 times as many marbles as B, and both together have 168; how many has each? (App., p. 143.)

APPENDIX.

QUESTIONS FOR EXAMINATION AND REVIEW.*

SECTION I. (PAGE 24.)

1. When two figures are placed side by side, what does the first one on the right denote? What the second?

2. What do the figures 24 denote? What 42?

3. How are the numbers from ten to twenty formed?

4. Write twenty on the blackboard. What does each figure denote?

5. What do the words fourteen, seventeen, etc., mean?

6. How many tens make thirty? Forty? Fifty?

7. How many tens and ones make twenty-three? Thirty-seven?

8. Write in figures forty-three. Fifty-four?

9. Thirty-eight and how many ones make forty? Make forty-two?

10. How many tens make seventy? Make eighty?

11. Ninety is how many more than eighty-nine? Than eighty-five?

12. How many tens make a hundred?

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* The questions in the Appendix are designed to supplement the several sections with suitable exercises for examination and review after the respective sections are finished. The examples are adapted to each grade and are intended to put in practice the principles taught in the corresponding sections.

13. How many figures are required to express a hundred?

14. What is the largest number expressed by two figures?

15. George is 15 yrs. old; how old will he be in 6 years?

16. Carrie is 12 years old; how old was she 3 years ago?

17. Name every other number from 1 to 20; thus, one, three, five, etc.

18. Name every other number from 20 to 1.

19. Count by 2's from 30 to 20. From 50 to 3.

20. Count by 10's from a hundred to one.

21. Count by 5's from a hundred to one.

22. Write in figures, fifty-seven; sixty-three; seventy-eight; ninety-seven.

23. How many tens and ones in seventy-nine? In eighty-seven?

24. How many tens and ones in forty-six? In fifty-four?

25. Write in words, 67; 54; 70; 83; 78; 91; 86; 99; 100.

26. What different numbers make 3? Make 5?

27. What different numbers make 9? Make 11?

28. Take 1 and 4 from 9, what is left?

29. Take 3 and 2 and 1 from 9, what is left?

30. John has 12 cents; how many more must he get to have 15 cents?

31. Lucy has 10 roses; how many can she give away and have 6 left?

32. What does the sign (=?) mean?

33. Copy and read the following: $12+3=?$ $13+15-3=?$ $27+13-24=?$ $35-16+23=?$

34. Write in Roman numerals the numbers seven, four, eight, nine, eleven, fourteen, nineteen, thirteen, seventeen, eighteen, twenty.

SECTION II. (PAGE 44.)

1. How many more units or ones are there in 16 than in 6? In 18 than in 8?

2. Seven years ago Harry was 8 years old; how old is he now? How old will he be in 9 years?

3. Julia's cat caught 4 mice one day, 3 the next, and on the third day as many as on the other two days; how many did she catch in 3 days?

4. Susan picked 12 flowers, 5 of which were roses, the rest were pinks; how many pinks were there? How many more pinks than roses?

5. Charles and Henry have the same amount of money; on a holiday Charles spent 25 cents for lunch and 10 cents for car-fare; Henry spent 10 cents for lunch and 5 cents for candy. How much more money had one than the other at night?

6. In a certain school containing 60 pupils are 4 classes; in the 1st class are 12 pupils, in the 2d 13, and in the 3d 15 pupils; how many were in the 4th class?

7. When it is half-past 3 o'clock, P. M., where do the hour and minute hands of a clock point? Where, at 15 minutes before 6 o'clock?

8. A dairy-woman had a tub of butter containing 56 pounds and sold 12 pounds of it; how much was left?

9. A milkman starting out with 65 quarts of milk, upset his wagon and spilt all but 15 quarts; how many quarts did he lose?

10. A farmer made 40 pounds of maple sugar one day, and 35 pounds the next; how many pounds did he make in both days?

11. A merchant sold 23 yards of silk to one customer, 25 to another, and 30 to another; how many yards did he sell to all?

12. William is 15 years old and his father is 48; what is the difference in their ages?

13. Write on your slate or blackboard the largest number expressed by *three* figures.

14. Write the smallest number expressed by *three* figures.

15. Write in figures the numbers one hundred five; one hundred seven; one hundred nine; one hundred thirteen; one hundred nineteen; one hundred twenty-seven; one hundred forty-three; one hundred ninety-four.

16. What does each figure in 105 denote? In 123? In 132? In 213? In 321?

17. What does each figure in 432 denote? In 342? In 324? In 243? In 234?

18. What does each figure in 1234 denote? In 2341? In 3412? In 4123?

19. How many units make ten? How many tens a hundred? How many hundreds a thousand?

20. What place do thousands occupy? Hundreds? Tens? Units? Ones?

21. How much greater is the value of a figure standing in the second place than in the first?

22. When standing in the third place than in the first? Than in the second?

23. When standing in the fourth place than in the first? Than in the second? Than in the third?

24. Copy and read the following numbers: 203; 320; 401; 510; 356; 419; 501; 603; 249; 640; 736; 844; 999; 1001; 1010; 1100; 1203; 1020.

SECTION III. (PAGE 64.)

ORAL.—1. What is the largest number expressed by *five* figures?

2. What is the *smallest* number expressed by five figures?

3. What are the names of the orders of units which stand in the first five places?

4. Name the orders of units denoted by each figure in the number 24635, beginning at the right.

5. Read the following numbers, naming the orders of units: 36405; 265340; 304207; 370563; 439200; 500364; 710405; 824009; 999999.

6. What is the largest number expressed by *six* figures?

7. How is a million expressed?

8. James paid 15 cents for a slate, 12 cents for a writing-book, and 30 cents for a Reader; how much did he pay for all?

9. Arthur gave 3 dollars for a pair of skates, 2 dollars for a sled, 10 dollars for an overcoat, and 1 dollar for a pair of mittens; what did his outfit cost him?

10. A farmer sold a cow for 34 dollars, a sheep for 6 dollars, and a colt for 38 dollars; how much did he get for all?

11. How many are 40 dollars + 60 dollars?

12. How many are 70 dollars — 20 dollars?

13. How many are 30 pounds + 50 pounds — 40 pounds?

14. A young man having 120 silver dollars gave 70 of them for a watch; how many dollars did he have left?

15. If he spends 25 dollars for a chain, how much will his watch and chain cost him?

SLATE.—1. How many different figures are used in writing numbers?

2. What are the *first nine* called? Why?

3. What is the other called? Why called naught?

4. What does the figure 3 denote when standing in the third place? In the fifth place? In the seventh place?

5. Write five millions, five hundred thousand, five hundred five.

6. A father bought a farm for each of his 3 sons; one contained 325 acres, another 431 acres, and the other 542 acres; how many acres did all three farms contain?

7. A man paid 4215 dollars for building his house, 1320 dollars for his barn, and 1132 dollars for stock; how much did the whole cost him?

8. If a steamship costs 85175 dollars, and a sailing vessel of the same size 63240, what is the difference in their cost?

9. If a man pays 825 dollars for a span of horses, and 420 dollars for a carriage, and then sells them for 1200 dollars, how much does he lose by the operation?

10. If a man whose income is 2875 dollars a year, pays 425 dollars for a horse, 210 dollars for clothing, and 200 dollars for travelling expenses, how much can he lay up?

11. What must you add to 358 to make 525?

12. A miller bought 642 bushels of wheat, 758 bushels of corn, and 923 bushels of oats; how many bushels of grain did he buy?

13. Copy and read the following numbers: 3450; 236045; 80305; 1208604; 800403; 2406210; 5036275; 7000200.

14. Write in Roman Numerals nineteen; fourteen; eighteen; twenty-nine; thirty-four; thirty-seven; forty; forty-four; forty-eight.

SECTION IV. (PAGE 84.)

ORAL.—1. A grocer sold 14 pounds of sugar to one customer, 7 pounds to another, and 5 pounds to another; how many pounds did he sell to all?

2. Richard has 15 chestnuts, William has twice as many, and John as many as both; how many have all?

3. If you have 50 cents and spend 6 cents for candy and 9 cents for peaches, how many cents will you have left?

4. Conrad spent 6 years in a common school, 3 in the academy, 4 years in college, and 3 years in a law school; how many years did he spend in getting his education?

5. Edwin had 27 doves; a cat killed 3 young ones, and he sold 6 old ones; how many did he have left?

6. Thomas went to market for vegetables; he paid 6 cents for radishes, 10 cents for beets, 12 cents for onions, and 15 cents for potatoes; how much did all come to?

7. Herbert had 50 apples; he gave 6 to one companion, 10 to another, and ate 4 himself; how many had he left?

8. What is expressing numbers by figures and letters called? What is reading them called?

9. The difference between Notation and Numeration?

10. Repeat the first nine orders of units.

11. Into what do you separate large numbers before you attempt to read them?

12. Read the following Arabic Numerals: 30205; 160420; 70203; 203407; 360075; 85670; 73300; 1001001; 2662085; 56703480; 278345624.

13. Read the following Roman Numerals: XL; LX; LXIV; LXXII; LXXIX; LXXXVIII; XC; XCIII; XCV; C; CX; CCLX; CCCC; DCCC; MC.

SLATE.—1. A drover bought 4 flocks of sheep; the 1st, contained 864; the 2d, 508; the 3d, 640; and the 4th, 486; how many sheep did he buy?

2. How do you write numbers to be added?

3. What do you do with the sum of each column?

4. What is adding the tens to the next higher order called?

5. A farmer raised 480 bushels of wheat, 365 bushels of rye, 648 bushels of corn, and 578 bushels of oats; how many bushels of grain did he have?

6. A man being worth 18432 dollars, spent 5645 dollars for a farm; how much money did he have left? Solve and explain the solution on the blackboard.

7. How do you write numbers for subtraction?

8. When a figure in the subtrahend expresses more than the figure above it, what do you do?

9. What is taking one from a higher order and adding it to the next lower order called?

10. A man being asked how much he was worth, replied, if you give me 6250 dollars, I shall have 15243 dollars; how much was he worth?

11. Mr. Vanderbilt bought 3 houses; for the 1st he paid 17250 dollars, for the 2d 23468 dollars, and for the 3d as much as for the first two; how much did he pay for all?

12. Which is greater, the sum of $4235+6230+2165$, or the difference between 456826 and 21232? How much?

13. A gentleman leaves by will 28460 dollars; to each of his 3 daughters he gives 3540 dollars, and the remainder to his son; how much does the son's portion exceed that of a daughter?

SECTION V. (PAGE 108.)

ORAL.—1. If a farmer makes 9 pounds of maple sugar in one day, how many pounds will he make in 12 days?

2. If a family uses 8 quarts of milk each day, how many quarts will it use in a week?

3. A housekeeper pays 10 cents for a peck of apples; how much must she pay for a bushel? For 2 bushels? For 3 bushels?

4. At 8 cents a pound, how many pounds of lard can be obtained for 96 cents?

5. A man having 75 acres of land, divided it into fields, each containing 5 acres. What part and how many acres did each contain?

6. A milkman has 2 cans of milk, each containing 10 gallons; how many persons can he supply with 5 quarts each?

7. What will 12 pair of boots cost, at $6 a pair? How many tons of coal, at $9 a ton, will it take to pay for the boots?

8. What is taking a number as many times as there are units in another number called?

9. What is the number multiplied called? To multiply by?

10. What is the result or answer found by multiplication called? Make the sign of multiplication?

11. What are the multiplier and multiplicand called?

12. What is finding how many times one number contains another, or separating a number into equal parts called?

13. What is the number divided called? To divide by?

14. The result or answer found by division?

15. The part of the dividend sometimes left?

16. Make the sign of division. Its meaning?

SLATE.—1. What will 45 safes cost at $32 apiece? Solve and explain the solution upon the board.

2. When the multiplier has two or more figures, how do you proceed?

3. What is meant by partial products?

4. Where must the first figure of each partial product be placed?

5. There are 15 houses, each house has 22 windows, and each window 12 panes of glass; how many panes of glass are there in the houses?

6. A drover bought 34 cattle at $45 each, and 52 at $30 apiece; he sold the whole at $40 apiece; what was his whole gain or loss?

7. The sum of two numbers is 250; the less is 75; what what is their product?

8. If 16 men can do a job of work in 24 days, how long will it take 1 man to do it?

9. If 1 man can build a shed in 45 days, how long will it take 9 men to build it?

10. What is the difference between Short and Long Division?

11. How is division proved?

12. Recite the Table of U. S. Money.

13. How many cents in a half-dollar? In a quarter-dollar?

14. How many cents in a half-dime? In 2½ dimes?

15. If you have a silver dollar and spend a half-dollar for a History, 2½ dimes for a Reader, and a half-dime for a pen-holder, how many dimes will you have left?

16. What will 12 gal. 2 qt. of milk come to at 5 cts. a quart?

SECTION VI. (PAGE 132.)

ORAL. — 1. Name the second method of expressing division.

2. What other name is given to this form of expressing division?

3. How is one-half expressed by figures? One-third? One-fourth?

4. How express two-thirds by figures? Three-fourths?

5. When a number or thing is divided into 4 equal parts, what are the parts called?

6. How find half a number? A third? Two-thirds?

7. What is a half of 12? A third? Two-thirds? A fourth? Three-fourths? A sixth? Five-sixths?

8. What is a third of 24? Two-thirds? A fourth? Three-fourths? A sixth? An eighth? Three-eighths?

9. What is an eighth of 56? A ninth of 72?

10. What is an eleventh of 121? A twelfth of 132?

11. When a number or thing is divided into equal parts, what are the parts called?

12. How many yards are there in 6 rods?

13. What part of a pound is 4 ounces? 8 oz.?

14. What part of a gallon is 1 pint? 2 pints? 4 pints?

15. What part of a bushel is 4 quarts? 8 quarts?

16. Frank having 20 cents, gave half of them for a slate; what did his slate cost him?

17. How many ones in 21 thirds? In 36 fourths?

18. If you have 48 quarter-dollars, how many whole dollars will you have?

19. At 10 cents a loaf, what will $5\frac{1}{2}$ loaves of bread cost?

20. What cost $6\frac{1}{2}$ pounds of sugar at 8 cents a pound?

SLATE.—1. What will 15 tons of hay cost at $12\frac{1}{2}$ per ton?

2. At $33\frac{1}{3}$ each, what will 27 hogsheads of sugar cost?

3. What will 26 elephants cost, at $185\frac{1}{4}$ apiece?

4. A man bought 20 cows; sold 12 of them at $35 apiece, and the rest at $40 apiece; he found he had made $120; what did each cost him?

5. How many yards of cloth, at $6 a yard, can be bought for $573?

6. A man pays $5000 a year rent for his store; how much is that for 6 months?

7. If a man's family expenses are $1575 a year, how much will they amount to in $7\frac{1}{2}$ years?

8. If it costs $2364 to grade a mile of railroad, what will it cost to grade $24\frac{5}{8}$ miles?

9. In a Florida orange-grove there are 187 trees, which average each year 200 oranges apiece; how many oranges do all bear?

10. At 3 cents an orange, how much is the fruit of such a grove worth a year?

11. The income of a young prince is $6750 a year, and his expenses are $8000 a year; how much will he be in debt in 7 years?

12. At $3\frac{1}{4}$ a ream, what will 32 reams of paper cost?

13. An agent sold 35 packages of cotton; each package contained 26 pieces, and each piece 42 yards; how many yards did he sell?

14. The quotient being 75 and the divisor 32, what is the dividend? What would have been the dividend if there had been a remainder of 6?

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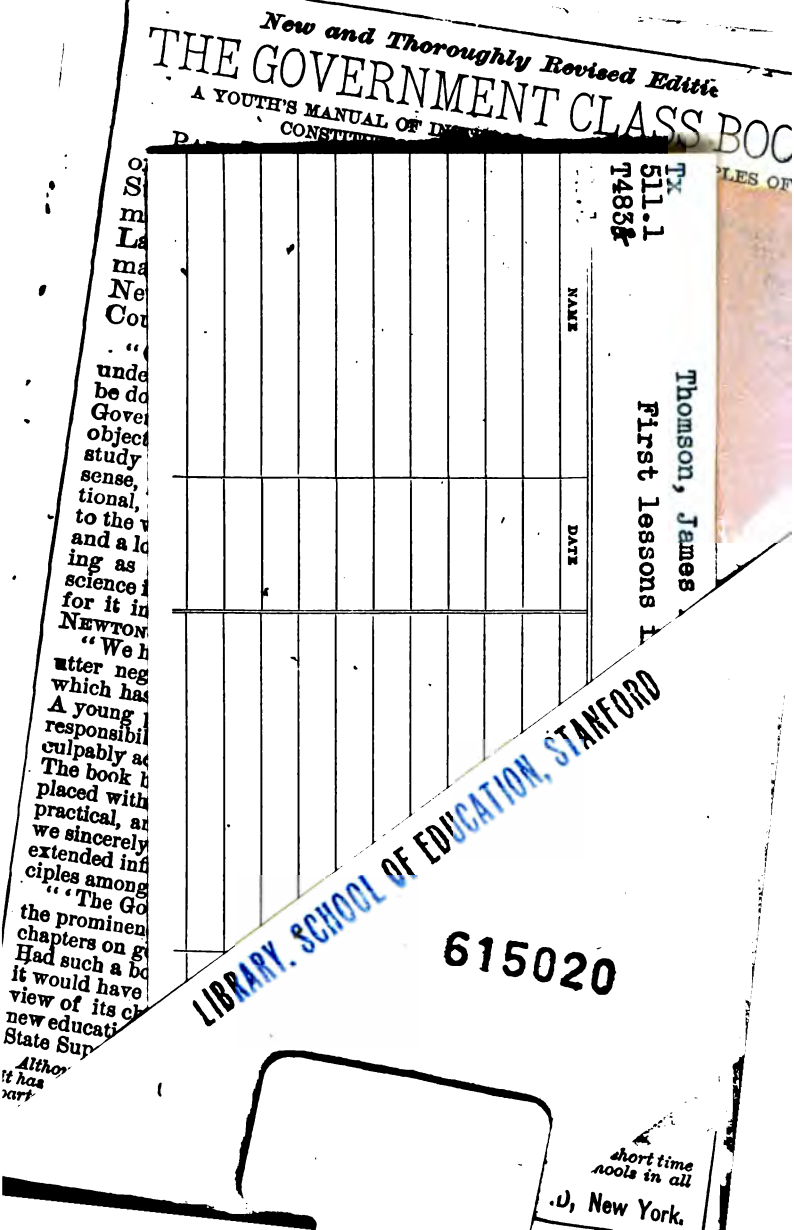
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